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EDITORIAL NOTES—GAS, &c.

The British Commercial Gas Association.

THE Association bearing this title has to-day a living existence. Before last Thursday, it was, as it were, an embodiment of something desirable, but without life. The ratification of the scheme, however, at the largely attended meeting last Thursday of the subscribers to the Publicity and Special Purposes Fund has brought it into actual being. The unanimous approval that the new organization—offspring of the Institution of Gas Engineers and of the fund—has received, is a matter upon which those who conceived and gave it form are to be most heartily congratulated. It has removed all trouble as to representation in the matter of the administration of the fund. The Institution of Gas Engineers, *quâ* Institution, had no power to appoint any administering committee on which others could serve who are not members of the Institution. The new organization surmounts the difficulty with added advantage. It will secure to the whole of the interests concerned proper and adequate representation; and the interests concerned will, according to the rights secured by their contributory power, be the electors within the terms that are laid down in the constitution and rules. This was abundantly recognized, by the remarks of representative men, at the Conference. Alderman Phillips, the Chairman of the Salford Corporation Gas Committee, regarded the scheme and the position of the fund as most encouraging. Mr. Councillor Kay, the Deputy-Chairman of the Manchester Corporation Gas Committee, described the scheme as having been admirably drawn up. Mr. A. W. Oke, a Director of several Gas Companies, asserted that the scheme placed the whole thing on a thoroughly sound business footing; and he added that many Directors were glad that provision had been made for representation going with taxation. Mr. H. J. Yates, the Chairman of the Society of British Gas Industries, was likewise of opinion that the new organization was an excellent stroke of diplomacy and good policy. The scheme itself emanates from the Institution of Gas Engineers. Therefore there is not a single section of the industry that has not had its approbation voiced.

All the good things that were said of the scheme at Thursday's meeting must have sounded pleasantly in the ears of the President of the Institution (Mr. Robert G. Shadbolt), who was in the chair, and in those of the rows of active and influential spirits of the Institution to the right and left sides of him on the platform. There is good reason; for apart from the need of the organization for a special purpose, it really constitutes a good piece of legislative work for the gas industry at large. Within this new organization, representatives of all the component parts of the gas industry will meet on common ground, with common interests, ambitions, and aims. Never before has there been any such means of showing a singleness of interest throughout the industry as this organization offers; and it is a development that is quite in harmony with the changed conditions and necessities of the industry's commercial life. What development the new organization may itself eventually lead to—if properly worked—we cannot predict; but that it is sufficient for the day is the present main consideration. It is to be a business organization, worked on business lines, with the profits lying in the defence and advance of the industry's interests. As the work opens and expands, it must have the effect of creating a still broader appreciation in the gas industry of the valuable influences of such effort as is about to be exercised, and will, we hope, early swell the numbers of subscribers. It almost gave one a shock to hear from the President that only about 12 per cent. of the gas undertakings of the country had so far contributed to the movement; but equilibrium was restored when it was heard that something like 45 per cent. of the amount asked for by the promoters had been subscribed. Another rendering to which would be that something like 45 per cent. of the gas sold in the United Kingdom is providing funds for giving effect to the purposes of the new organization. This is, as Alderman Phillips said, encouraging; but, as Mr. Yates observed, it is disappointing to find that such a small percentage of the undertakings has come into line. However, financially it amounts to this, that there are already definite promises of £10,635 12s. 6d. from the home gas-supply industry; from Australia £94 8s.; and, although Mr. Yates cannot speak positively for the Society of British Gas Industries till their meeting is held in November, he is looking forward to the pleasure of being in the position to announce that the members are prepared to stand responsible for at least £1500. This makes a total of £12,135 12s. 6d., which is not one-half of the amount that the originators of the movement desired, and not half the sum that those who know the most about advertising in the gas industry—the manufacturers—told the meeting, through their mouthpiece on Thursday, should have been the one with which the work should have started the first year's operations. However, we must be content, while cherishing the hope that other revenue tributaries will soon be opened up.

Enthusiasm animated every individual at the meeting; but enthusiasm was not allowed to carry those present from the fact that the occasion was one for business. In that spirit the proceedings throughout were conducted. A proper keynote was struck by the President of the Institution when he said in his opening remarks that the movement had advanced beyond the stage of discussing the advisability of propaganda work, and what had now to be decided were the best means of pushing forward. The larger part of the time of the meeting was spent in talking over details surrounding the questions of representation, voting, and other matters; but there has not been—and no one suggested—any substantial modification of the lines of the scheme as originally published. Only betterment in the matter of minor details has been effected. Therefore, if we say that the scheme was unanimously approved; that there has been a districting of the United Kingdom practically following the territories of the District Gas Associations (as shown by a map on another page of this issue) for the purpose of convenience—mainly on the matter of the election of representatives; that the Provisional Committee who have been carrying on the organization to the present stage have been asked to continue to serve till the General Committee are elected; that the Secretaries of the District Associations are to be requested to undertake the duties of election officers; and that it has been arranged to hold the first annual meeting of the Association in the autumn of next year at Manchester—the centre of a district which ranks as the second largest supporter of the movement—then the conclusions of the meeting are presented in a nutshell. Really, as a conference, there could not have been more unanimity on principles and of principals; and such unanimity and approval augur well for the future. The Association is launched; and we wish it, as all must do in the gas industry (whether present participators in material support or not), a successful and honorable career.

The Institution President for Jubilee Year.

THE year 1913 will be the Jubilee Year of the foundation of the central organization of the gas industry, under the title of the British Association of Gas Managers; and such an occasion cannot be allowed by the Institution of Gas Engineers to pass without some special recognition. The first question that arose, when considering the matter, was that of the nomination of President. Need we say that the minds of the Council were at once set on Mr. Corbet Woodall. It has been an open secret that, in order to relieve him of the duties of the vice-presidency (and thus provide one more inducement to the acceptance of office), Mr. J. Ferguson Bell, of Derby, who has occupied the office of Junior Vice-President, and is now the Senior Vice-President, has generously agreed to stand on one side in what

would have been his presidential year, if Mr. Woodall could be prevailed upon to accept the presidency, in succession to Mr. R. G. Shadbolt, so that the annual meeting at which he would preside would fall in the year that will be the fiftieth anniversary of the central organization. We are glad to learn —since the Council meeting last week the matter has been freely circulated in conversation—that Mr. Woodall has consented to take office, provided that it is the wish of the great body of members (which is a foregone conclusion); and he does so, we know, feeling deeply both the honour of the invitation and that, of health and strength permitting, being the titular head—as he is now generally acknowledged to be *de facto*—of the gas profession during the year completing fifty years of co-operative technical effort.

This will be the fourth occasion that Mr. Woodall has occupied a presidential chair among his professional colleagues. He was President of the British Association of Gas Managers in 1878; of the old Institution of Gas Engineers in 1897; and of the Southern District Association in 1901. The time that he was the occupant of the presidential chair of the British Association of Gas Managers, was thirty-three years ago; and how much has happened in the gas industry in the intervening time! As President then, Mr. Woodall did not speculate; but as we survey the position of the gas industry to-day, the thought passes through the mind that he will have much to say as a supplement to words he employed in 1878. "Looking to the enormous importance of the gas "industry now," he then remarked, "it is hard to realize that a "generation which saw the incorporation of the first gas com- "pany has not yet passed away. . . . Year by year, with "steady strides, the demand for gas has advanced, and with "it the demand for gas makers." Nineteen years fled before Mr. Woodall took the presidential chair of the old Institution; and again he spoke of the remarkable expansion of the gas industry. If "a remarkable expansion" then, what must be the description now? We shall, though twenty months is a long span over which to project anticipations, look forward to a review in a further Presidential Address composed from an experience unexampled as a gas engineer at home and abroad, as a gas administrator, as a defender of established, and as a promoter of new, interests in the Parliamentary Committee Rooms, and as Governor of the Gaslight and Coke Company, under whose policy the huge concern has been raised to a very live power in the gas industry. We congratulate the Institution upon securing for their President in 1913 one whose eminence and personality entitle him to the honour of the dignified office in the Jubilee Year of the organization.

One other "open secret," while we are in the vein. We have reason to know that those in authority are contemplating, in connection with the Jubilee celebrations, a Gas Exhibition which shall eclipse all its predecessors.

Consumption and Gas.

It is an exceedingly good thing that gas has the strong ramparts of long public experience to defend it; otherwise it would suffer great injury from the inimical attacks assiduously made upon it by its commercially interested competitors. Indeed, if there is now anything left to say in vilification of gas that has not been said since the electric supply of our cities and towns began (there have been some wonderful discoveries in regard to gas during the period), we cannot, though we may harass our brain in the exercise, think what it can possibly be. Medical returns assure us the health of the nation as a whole was never better than in the present days; the Board of Trade returns tell us that the business in the sale of gas has doubled in the British Isles the last twenty years; the electricians inform the public that its health is much impaired, and that it is suffering all the ills that flesh is heir to, simply because the great majority continue to use, and use more liberally than ever, that all-round servant—gas. The statements that have been put into circulation by the electricians in this connection do not here require the description which is their due. Now if we are right in construing as referring to gas the word "otherwise" in a document we have before us (as we are sure the residents of Hammersmith will do, in view of the context, particularly of the part referring to electric light), then gas is now charged with contributing to consumption. In the event of the gas suppliers in Hammersmith not having already seen a copy of the document alluded to, they are at liberty to have the one in our possession, which has reached us from a Hammersmith resident—proving, we think, that he regards the words as applying to gas.

The author of the document is N. C. Collier, L.R.C.P., L.S.A., the Medical Officer of Health to the Hammersmith Borough Council, who control the local electricity supply undertaking. It is dated August, 1911, and is headed "Precautions for the Prevention of Consumption." One of the clauses reads: "*Where practicable, electric light should be* "*used for lighting purposes* in dwelling-houses and other occu- "pied buildings, *as nothing tends more to the production of con-* "*sumption* than the breathing of an atmosphere charged with "the products of combustion, whether such products are "the result of overcrowding or *otherwise*." The word gas is not used in the clause; but we suggest, having regard to the opening words, that it is intended that more shall be understood by the recipients than is actually expressed in words —in short, that it shall be inferred that the Medical Officer of Health of Hammersmith had gas in mind. So regarded, it is calculated to do injury to an important concern carrying on a business under statutory authority, and against which business the Hammersmith Borough Council are in competition through their electricity undertaking. We look upon the statement as being gravely detrimental to the interests of the local gas concern in particular and to the gas industry generally, seeing that it bears the signature of N. C. Collier, L.R.C.P., L.S.A. We do not know whether the matter will be considered of sufficient seriousness, especially coming just after a time when we have been hearing a good deal about the prevention of consumption, for the gas company chiefly concerned to take steps to obtain an explanation, withdrawal, or modification of the statement. But, apart from this, we should like to ask Dr. Collier whether, with a sale of gas, in the areas of the three London Gas Companies, during the twelve months ending with June last, of approximately 42,000,000,000 cubic feet, he can point us to a single case of consumption produced through the use of gas in a dwelling-house or other occupied building. It is all very well for a local authority to advise on matters affecting health; but it is another matter to take advantage of their position to peg in an advertisement for a trading undertaking of their own, and simultaneously make (whether directly or inferentially) an allegation of the—possibly, to some people, alarming—character of this one, which may do serious injury to a competing concern carrying on a statutorily authorized business. It will be well, perhaps, not to say more than this at the present time. The document referred to has been circulated among the residents in envelopes headed "Hammersmith "Borough Council."

Gas Legislation.

If in the present—it is mayhap a bit early to form any judgment—we have not the presage of a great number of Gas Bills for the next session of Parliament, it looks as though there will be some that will be vastly interesting if things go well with the schemes in the preliminary stages. The Birmingham Corporation, for instance, are proposing new land powers, and the Salford Corporation are intending, if they can in time agree with their outside adversaries—adversaries only over certain matters of policy—to again step into the parliamentary arena. Of course, agreement with outside authorities does not necessarily mean endorsement by Parliament. Unopposed Bills are now looked into much more narrowly than they were formerly; and it is wonderful how the very face of Bills can be altered by the Private Bill Authorities modifying a feature here and there, without any discussion before a Select Committee. Then there is the project for another Joint Burner Bill referred to in last week's issue. News may come early now of other interesting schemes. Anyhow, it is almost certain that next session will see—though the number may not be great—gas schemes that will perhaps contribute to relieve it from the almost continuous monotony that characterized the one just ended.

Touching the Acts of this year, our customary review is in hand; and the first article appears in our columns this week—notice being given of the measures of the Gas Companies who came for incorporation. We cannot help observing the large amount of repetition there is in these Acts of clauses that could just as well be dealt with by reference if our General Acts were modernized. Clauses that are of common application have had their number enlarged of late years. In all the Acts before us this week, we have, for example, the new auction clauses, the special purposes fund, the reserve fund, the prepayment, and numerous other clauses that appear, *verbatim et literatim*, in Act after Act. We get tired of saying these are included; and it may be

taken for granted nowadays that, if they are incorporated in a measure, there is no great, and very rarely any, departure from the Model Clauses—never mind what changes were ventured upon in the clauses as inserted in the original Bill—by the time it has matured for Royal Assent. The Bills that are noticed this week represent for the Gas Companies concerned the first time of asking for full powers direct of Parliament. This being the case, we should not be prepared to question any assertion that the promoters took a fairly generous view at the outset as to what capitals and standard and maximum prices should be; and Parliament has in most instances seen fit to use the pruning knife, or, if not Parliament, perhaps diplomatic agreements have been the operating cause for the reductions—in some instances heavy reductions—that we see here. Associated with the special purposes fund, it is remarked that it has become quite general for the carry-forward of undivided profits to be limited to an amount not exceeding the requirements of a year's dividend. Also noticed is the growth of the tendency to ask for the right to declare an interim dividend without calling a half-yearly meeting of the shareholders. We are not sure that the exercise of this power is altogether a good thing for those Companies who meet at the place where their operations are carried on. We believe in shareholders being kept in close touch with the operations of the Company; we believe in the advertising opportunity that a well-prepared half-yearly speech delivered from the chair affords. A matter that meets with greater approbation is the growing power inserted in Acts for appointing professional accountants as Auditors, and not necessarily professional accountants holding shares. In the Acts treated upon this week, the useful form of stand-by clause in the Sidmouth Bill remains; while the one that was in the Chesham Bill has been expunged.

The local authorities have been busy obtaining the insertion of purchase clauses in the measures of the non-statutory Companies who have now reached the dignity of full statutory power. These clauses appear in the Ashbourne, Chesham, and Sidmouth Acts; but they will automatically collapse if the authorities do not proceed to exercise them in the coming session of Parliament. In the case of the Chapel Whaley Bill, one outside authority obtain the right to purchase the portion of the concern in which they are interested, if they think fit, after the lapse of twenty-five years; and another can acquire, by giving the stipulated notice, the distribution plant in their area at any time—subject in both instances to the necessary parliamentary powers being obtained. But a striking feature of the Acts is the activity that has been displayed by the road authorities in obtaining their full pound of flesh and over in the matter of the opening of the roads, reinstatements, and depths of gas-pipes, as well as exemption from liability in respect of any damage occasioned by steam-rollers or other road appliances. In two or three cases, exemption has been obtained for steam-rollers up to a weight of 15 tons; and in the Chasetown Gas Act, "the reasonable and proper use of *any* "steam-roller" is mentioned. Concerning the depth for gas-pipes, 2 ft. 6 in. now appears as the favourite prescription; but, in one or two of the Acts, the wording of the clause is such that there might well be argument as to whether it was intended that the cover of the pipes from the surface should be 2 ft. 6 in., or the bed of the pipe should be at that depth. The words are: "The same shall, if possible, be laid or "constructed at such a depth *not exceeding* 2 ft. 6 in. below "the surface of such street, as the Council may direct." If the pipes are "laid" at a depth "not exceeding" 2 ft. 6 in., that surely would refer to the bottom of the pipe and not to the cover of soil. There is a growth of application for electric supply powers. The Sidmouth Company have obtained full authority in this regard; while other companies have received sanction to apply for Provisional Orders.

Sales Experiences.

Among the contributions to the proceedings of the Junior organizations, we frequently come across the experiences of workers whose duties are conducted under exceptional circumstances, and the narration of which experiences are highly instructive. We class in this way the presidential address of Mr. R. J. Rogers to the Midland Junior Association, delivered on Saturday. His work lies in the fittings and sales department of the Birmingham Corporation gas undertaking; and the area of the undertaking is one of the finest spheres of which we know for diverse experiences in the matter of gas sales. Though the address is long, Mr. Rogers by no means exhausted the subject-matter that he had at hand; and we could have wished there had been a little sacrifice of some of the questions over which we are all agreed, and that those subjects which the President mentioned towards the end of his address had received treatment. We do not, however, say this in any disparagement of what appears in any part of the address. But experiences are valuable; and those that we have recounted here make us wish for more—especially in these days when there is so much to be done in connection with the sales department of any undertaking in encouraging and extending the use of gas by educational methods, and by politic acts which are both prompted and forced upon us by the natural wish to see those interests advance with which we are identified, as well as by a remorseless competition.

"We must," says Mr. Rogers, "appreciate the circumstances "in which we are placed by our competitors." Certain it is (though this statement must fall short of universal application) that the Committee and executive of the Birmingham Gas Department are very much alive to the proper provision and exercise of those ways and means that result in commercial success. Duty and responsibility demand this of them; and no lack of initiative and execution is found there. In this relation we are in full accord with the President that, in the commercial department of a gas undertaking, technical knowledge is required to-day by the workers that had no, or very little, part in a past not far distant. We are therefore pleased to see that the Midland Junior Association are opening their doors wider than before, and that, beyond this, they have enlisted the sympathies of Professor Burstall to act as intermediary between them and the Birmingham University authorities for arranging some courses of lectures at that scholastic centre. This is good. But associated with the question of education and with one or two other matters, the President makes suggestions for the consideration of the new British Commercial Gas Association. Numerous like suggestions could be made. But let us give one word of warning. It is that the new Association have for some time to come their work cut out in efficiently looking after primary objects, without taking in hand secondary ones. There must be no shifting of duties upon the new Association—such as the question of a syllabus and course of instruction for gas-fitters, with local examinations—that can be well and properly carried out by the Institution of Gas Engineers.

When dealing with general distribution matters and questions of policy, there is so much that Mr. Rogers has to say with which we are in full agreement that, though tempted to mention them, we feel compelled to pass them over, and more especially as there is a striking variation from an ordinary course of commercial gas procedure that answers well in Birmingham, as well as a power experience, to which we desire to draw especial attention—in fact, the mere mention of these two matters will be quite sufficient to induce the readers of these observations to turn to the address for further details. The part that the Birmingham Gas Department are taking in promoting the high-pressure gas business is well known; and in connection therewith, in addition to the industrial applications, there is being developed a considerable business in shop lighting. In this connection—in connection with shop lighting generally—and in the matter of gas-fires and so forth, the department are encouraging the hire system to the fullest extent. They are out to do business; and there are no inflexible cast-iron rules in their policy that refuse to be bent to the conditions of different consumers. They make their business methods fit circumstances; and we like the idea. An instance is found—though this particular one rather smacks of an ancient and derelict business custom in the gas industry—in the contracts for shop lighting, in which the shopkeeper lights and extinguishes as he requires; payment being made according to an agreed monthly schedule of hours. The hours that different shops remain open in Birmingham vary considerably; and the shopkeepers like the idea of not being at the complete mercy of the lamp lighter and extinguisher. No difficulty is found. A shopkeeper has his own rules about closing hours; and at no time is there more than a few minutes' departure from the specified time for discontinuing business on different days. Beyond which it is quite easy for the department to check the schedule of hours by inspection. However, this lighting and extinguishing by the customer of lamps supplied for illumination at a fixed charge, is a distinct variation from ordinary practice; but there it is—Birmingham finds it answers and pays.

Now for the second experience to which we wish to draw

special attention. For Birmingham, the boom in suction-gas plants has died away. The manufacturers have had their experience; and they prefer town gas at 1s. 6d. per 1000 cubic feet, less 5 per cent. In 1906, when the merits of suction gas were being advertised as superlative in character, so far as could be ascertained the number of producer plants in the district of supply was 150; to-day, the number is only 60. The information that Mr. Rogers gives under this head is interesting, and it will be particularly useful. It is a tale of dissatisfaction on the part of manufacturers with their change-over to suction gas plants, with a quick return where possible, and with a solemn intention in other cases not to defer a return longer than is practicable in view of the expenditure made in adopting the plant. So we might go on drawing here and there from the address, and the while picking up fresh instruction from experiences presented in a most refreshing style.

The Woodall-Duckham Retorts at Lausanne.

From time to time reference has been made in the "JOURNAL" to the installation of Woodall-Duckham vertical retorts in the new gas-works of the Lausanne Municipality at Malley, a suburb of the city; and in the number for Nov. 29 last year a plan of the works and views of the buildings, with some general particulars, were given. The special feature of these works is the installation of retorts just alluded to; and attention was directed to it by Mr. J. P. Leather, of Burnley, in the paper on the Woodall-Duckham system as carried out at his works which he read at the last meeting of the Institution of Gas Engineers. Sections of the Lausanne retorts were given, accompanied by some particulars in regard to them. They have been in use since the beginning of the year; and in another part of the "JOURNAL" will be found the translation of an article by M. Cornaz, the Gas Engineer to the Municipality, in the current number of "Le Gaz," giving the interesting results obtained with English, French, and German coals used alone or in admixture. Without going into details here, it may be mentioned that the installation has worked thoroughly satisfactorily, and has more than fulfilled the guarantees of the Contractors. It furnishes the entire gas supply for the city; the quality of the coke produced is good, and is preferred by consumers to that coming from the horizontal retorts; and the tar has been employed for Diesel engines. Altogether it would seem that the Municipality have every reason to congratulate themselves on the results so far obtained with the new system of carbonization. By a rather curious coincidence, the Lausanne installation is referred to at some length in the course of an illustrated article, descriptive of the "Burnley Gas-Works Extensions," which appears in the current number of "Engineering"—accompanied by a double-page engraving, giving many details.

Mr. P. C. Holmes Hunt Replies to his Critics.

The reply of Mr. P. C. Holmes Hunt to the parts of the carbonizing discussion, at the Institution meeting at Glasgow, alluding to his paper, is to hand; and the opportunity that he has had to thoroughly digest the criticisms to which his communication gave rise has enabled him to give a better considered reply than would have been possible in an extempore answer at the time, had it been within his power to be at the meeting. Without reference, and relying on recollection, Mr. Hunt appears to have fairly covered the points raised. From the time the paper first came under scrutiny, we have not been disposed to allow that any personal association weighed with Mr. Hunt in making what he genuinely believed to be a right selection of carbonizing plant under his local circumstances in regard to coal and coke; and his reply accentuates this belief. If any other manifestation were required of his mind being free from any preferential considerations other than those that should weigh with a responsible advising engineer, it is to be found in the hope deliberately made public in his reply. "I am sure," he writes, "I hope that Mr. Thomas Glover's prophecy—that the British system will prove itself, in the course of a few years, all-round superior to one having its origin abroad—will be realized." National prejudice is all very well in its place; but in industrial processes, the best is what is wanted, no matter its source, and whatever our private feelings, the fittest will survive. If national prejudice were allowed to universally rule, there would be very little chance of the British continuous system of carbonizing making much headway abroad.

Local Conditions in Selection.

Since Mr. Hunt finally selected the Dessau system for Melbourne, the choice by other gas engineers at home of the continuous system has been on a liberal scale; and this rather brings into relief the point that he made one of the strongest in the case for his selection, and which his critics did not sufficiently recognize, that his local conditions in regard to coal and coke weighed strongly with him in determining choice. It may be—it cannot yet be said that it will, though the rival advocates hold strong views on the subject—that time will prove he made too much of this point. But he has a right to it being considered at the present time in relation to the question of his independence of judgment. There will come a time when Australian coal and the resultant coke, through the daily working of continuous and intermittent plants in Australia, will do more to settle the question of superiority of system than any amount of wordy warfare to-day. Contrary expert views may exist now as to possibility; but Sydney and Melbourne will, in due course, give us the reality. We can wait for this; and there the matter may well remain for the present, so far as Australia is concerned. Meantime, in making comparisons of competing systems, it would be well to adopt the working experiences with the constructed examples of the latest developments. This is a line of action Mr. Hunt, in alluding to the question of labour, insists should, in fairness, be taken.

Fires and Fusings.

While the friends of the electricity industry are advising householders to electrify their homes from drawing-room to kitchen, and telling them that safety is one of the things they will enjoy, electricity continues to, on its own account, publicly give the advocates the retort discourteous. Everybody who picked up a newspaper last Wednesday evening and Thursday morning read of the fire, which caused much inconvenience to the firemen engaged, that broke out in the cold storage department of Messrs. Lovell and Christmas, at No. 12, West Smithfield, and everybody learned too that "the outbreak was caused by the fusing of an electric wire." The intelligence was also spread on Thursday morning that some excitement was caused the previous evening by an outbreak of fire at the New Street (Kennington) Station of the City and South London Railway. As a train ran into the station, a junction box at the down end of the platform became ignited; and at the same time some cable at the other end of the platform began to smoulder. Fortunately, the outbreak soon succumbed to the use of sand. Farther afield, we learn from the "Scotsman" that, on the previous Saturday evening, an outbreak of fire destroyed the engineering departments of the Mossend Iron and Steel Works, Bellshill, belonging to Messrs. Beardmore. It is "surmised" the fire originated through the fusing of electric cables, which stretched across the roof from the power station. The damage is estimated at £6000; machinery to the value of £4000 being a total wreck. There have again lately been quite a crop of "mysterious" outbreaks in the country—the causes of which are "unknown."

The New Industrial Council.

The Government action in appointing an Industrial Council, providing fresh machinery for preventing strikes, was favoured with a large amount of public attention last week, and with a variegated mass of views. The purpose of the Council is excellent; but the meagre details concerning it are sufficient to show that it cannot avail much without any power or force behind it. It appears to be only an enlargement, in national garb, of the Conciliation or Arbitration Boards, in which the Trade Unions assert the men have no confidence, and which they, in the larger industries, have overthrown in favour of an extended application of the power of the strike. There is no objection to the composition of the new Industrial Council. The employers' representatives are all estimable gentlemen, and the representatives of labour have all earned position by their individual exertions on behalf of industry's workers. Their numbers, too, are equally divided. But what are the objects of the Council? It has been established to investigate matters referred to them affecting disputes, and to take "suitable" action in regard to any dispute referred to them affecting the principal trades of the country, or likely to cause disagreements involving anciliary trades, or which the parties before or after the breaking out of a dispute are themselves unable to settle. The idea of the Government is to stiffen the Board of

Trade in the discharge of their duties under the Conciliation Act of 1896, by providing the Board with effective means for referring such difficulties as may arise in a trade to investigation, conciliation, or arbitration. The whole scheme seems to be merely a temporizing with the difficult question of trade disputes. The root of the trouble has to be attacked, and not the growth. If the new Counell is a real success, it can only be through gaining the confidence both of the country's workers and employers. We sincerely wish it well, but are not hopeful. In a letter addressed to the Board of Trade, by Mr. Will Thorne, M.P., Chairman of the Parliamentary Committee of the Trades Union Congress, and General Secretary of the Gas Workers' and General Labourers' Union (in which he declines an invitation to serve on the Council), he remarks: "In my opinion, such a Council would weaken the power of organized labour; and I am not prepared to have the power of organized labour curtailed in the slightest degree without entering an emphatic protest. That is a view that has, since the announcement was made as to the composition and designed duties of the Council, been generally endorsed in Trades Union circles. An unlimited power to strike, and nothing less, is the chief constituent of the Trades Union programme to-day."

National Coal Strike Threats.

Comment was lately made in our editorial columns as to the national peril through conspiracies against the common weal engineered by the Socialist leaders of the Trade Unions. Bearing upon this, the recent miners' conference at Southport brought us face to face with the distinct possibility of a national coal strike. This will depend on the result of negotiations with the coal owners; and if there is not agreement, then there is to be a further conference of the miners on Nov. 14, to be followed by a ballot on the subject of a national strike. One thing among others that the miners require is a higher standard of minimum wage. This was a subject that was under discussion between the coal owners and miners of Northumberland on Saturday week; and the Southport Conference did their part in stiffening the backs of the Northumberland men by promising to support their demand. But there is another sign of the times. and that is that the miners are desirous of curtailing their notices—a fortnight is mentioned—and to make them presentable and terminable at simultaneous times throughout the coal-fields. The object of this is to prevent buyers having time in which to lay in considerable stocks, as large reserves in the hands of buyers are in favour of the owners, and against the men. It is well to note this; and also that the date given for the conference, if there is not an agreement on points in dispute, is Nov. 14. If a ballot follows that date, and results in the declaration for a national strike, the strike would fall in the depth of winter. We do not want to act as alarmists; but there is good and sufficient cause for extra caution. If things in the labour world go on as they are now, gas undertakings without water-gas plants will be considering the advisability of obtaining one, and not allowing themselves to be entirely cleared out of coke.

The Claims of Free Labour.

With so many noisy demands being made for attention to the claims of trade unionists, it is necessary that free labour should also assert itself. This, as a matter of fact, it frequently does do—very effectually; and that its rights are recognized in many responsible quarters, is manifested once more in the proposal of London manufacturers, referred to in last week's "JOURNAL," to combine with the object, among other things, of taking such action as may be necessary for the protection of free labour. It seems too simple a proposition to need argument, that employers should be at liberty to engage such men as they may think fit, and employees should similarly be allowed to work for such masters as they choose. But it is a view of matters which does not appeal to trade unionists. Very shortly the National Free Labour Association will be holding their nineteenth annual congress; and one of the resolutions to be proposed thereat calls upon employers of labour throughout the country to stand up for their right to engage a man according to his ability, and irrespective of his membership of any trade union or other society, as well as "their undoubted right to manage the businesses which they create, for which they provide capital, and for which they are responsible." The Association claim to represent 800,000 registered independent workers who are opposed to Trade Union Socialism; and grave alarm is felt by them at the growing tendency of employers' associations to enter into "closed shop" agreements with trade unions, by which the trade unions seek to make it impossible for any free and independent workman to sell his labour. The report of the Association shows that a great deal of work is done in the way of supplying labour when required; and during the past year they have, as usual, materially assisted the employers in combating many actual strikes and threats to strike. It is an organization which, in these troublous times, may well be borne in mind.

Some Income-Tax Figures.

There are some big figures in the report of the Commissioners of His Majesty's Inland Revenue for the year to March 31 last, an important section of which contains statistics in the usual form relating to income-tax assessments treated as having been made in the year 1909-10. It is pointed out, however, that, owing to the delay in the passing of the Finance Bill, a considerable number of assessments for that year, which in normal circumstances would have been made within the year, were not, in fact, made until after the end of the year. Wherever practicable, the delayed assessments have been brought into the statistical accounts for the year 1909-10; but as it has not been found possible to adopt this course in all cases, the figures in the report are somewhat smaller than they would otherwise be. Coming to individual industries, and bearing these remarks as to probable incompleteness of the figures in mind, it is seen that the gross assessments on the profits of gas-works in the United Kingdom for 1909-10 (the assessments made each year being based on the profits of the preceding year) were £7,384,931, in respect of 1550 concerns. The details are: 1141 public companies, £5,056,456; 317 local authorities, £2,310,999; 72 persons, £14,083; and 20 firms, £3393. Of the companies, 23 included under the Metropolis figure at £1,907,414. The gross assessments on profits of water-works in the United Kingdom for the same period (the assessments made each year again being based on the profits of the preceding year) were £6,062,271, in respect of 2437 concerns. In this case, the details are: 320 public companies, £1,273,442; 1415 local authorities, £4,745,443; 618 persons, £25,596; and 84 firms, £17,790. Under the heading of the Metropolis, there are ten companies, which figure at £14,446; and one local authority, at £1,500,000.

Mr. E. W. Smith's Manchester Lecture: Corrections.

Our attention has been called to the following errors in Mr. E. W. Smith's Manchester University lecture on "High-Pressure Gas Distribution" which appeared in the "JOURNAL" last week:

In the table of constants in col. 2, p. 108, the value of the coefficient of friction is given as $\cdot 0044 \left(1 + \frac{1}{7d} \right)$, and it should have been $\cdot 0044 \left(1 + \frac{1}{\gamma d} \right)$.

In the same column, Unwin's formula is defective at the end. It should be $Q = 1{,}323{,}250 \sqrt{\frac{p_1^2 - p_2^2}{p} \left(\frac{p_1}{p_2} \right)^{\frac{2}{n}} \frac{d^5}{\zeta S l}}$, and not as printed.

In the table showing the delivering capacities on p. 109 (Unwin's formula), the quantities 426,360 and 204,460 should be reversed—204,460 and 426,360.

The Blaess formula, on p. 109, should read: λ = coefficient = 0·0125, &c., not λ = coefficient − 0·0125, &c.

Illuminating Engineering Lectures.—In the last volume of the "JOURNAL" (pp. 663 and 821) full particulars were published of a course of lectures on illuminating engineering arranged to be given at the Regent Street Polytechnic. We learn that there is to be a similar course of twelve lectures at the Battersea Polytechnic—the first six to be delivered on Tuesday evenings at 7.30, commencing Oct. 17; and the second six on Friday evenings, commencing Jan. 12, 1912.

Yorkshire Junior Gas Association.—We learn from the Hon. Secretary (Mr. E. Garsed, of Elland) that the ninth annual meeting of the Association will be held at the Mechanics' Hall, Bradford, on Saturday afternoon next. The chair will be taken by Mr. F. Scholefield, of Dewsbury, the retiring President; and the business will consist of the presentation of the report of the Council on the work of the past session and the statement of accounts. At the close of the meeting, the members will proceed to the Thornton Road Gas-Works of the Bradford Corporation, where, by permission of the Engineer (Mr. Charles Wood), an inspection of the installation of Glover-West vertical retorts, now in course of construction, will be made.

BRITISH COMMERCIAL GAS ASSOCIATION.

Publicity Movement—Organization Scheme Adopted.

A Meeting of the Subscribers to the Publicity and Special Purposes Fund of the Institution of Gas Engineers, for the purpose of establishing an Association for administering the fund, was held at the Institution of Mechanical Engineers, Westminster, last Thursday afternoon—Mr. R. G. SHADBOLT (President of the Institution of Gas Engineers) in the chair.

PRESENT FINANCIAL STRENGTH.

The CHAIRMAN, in opening the proceedings, said the object of the meeting was not so much to discuss the advisability of undertaking a publicity or propagandist movement, because this had already been agreed upon, but to decide upon the best means of achieving the object they all had in view. The necessity for pressing forward and bringing the matter to a rapid issue was, if anything, greater now than it had ever been. There were many interests watching their actions in this particular direction, and the current of vituperative misrepresentation which the industry was called upon to meet was in itself a sufficient reason for going forward with as little delay as possible, and placing themselves in line with all other live businesses in the matter of advertising and education. It was from the meeting held in April, supplemented by the Salford Conference, that they now took their cue,

The Proposed Division of the United Kingdom into Areas—Showing (by dots) the Number of Present Contributors to the Fund.

to forge ahead. The further the Publicity and Special Purposes Committee had gone into the matter, the more convinced had they become that the half-crown basis upon which they started was the absolute minimum which would enable the Association to carry out its work unhindered and in a proper manner. The reason for forming a separate Association, instead of having a Committee of the Institution of Gas Engineers, was that they had no authority to form a Committee upon which individuals might serve who were not members of the Institution. Mr. Shadbolt then proceeded to call attention to several amendments on matters of detail which, on further consideration, had been made by the Committee in the draft rules. The General Committee would be formed by the representation of districts *plus* other individuals; and the election of the Committee involved dividing the United Kingdom into suitable districts. After full discussion, the Committee considered that the best and most efficient way of dividing-up the country would be to follow the lines, as nearly as possible, upon which the District Gas Associations throughout the country were divided. Scotland would form one district, and the whole of Ireland another; the same in regard to Wales and Monmouthshire. England would be divided into six districts, to be called the Manchester, Midland, Northern, Eastern, Southern, and South-Western districts. If these districts were adopted, there would be found ready to hand the necessary machinery for electing the District Representatives to the General Committee. The subscriptions from the undertakings would be collected by the staff of the Institution of Gas Engineers; and after the special purposes proportion had been deducted, the balance would be paid to the account of the Association. The Committee were very anxious that the most should be made of the advertising side of the Association when formed; and to this end it was proposed that they should be at liberty to meet in a different town occupied by the subscribing undertakings at each of the annual meetings, which, it was thought, would popularize the movement, and be in itself an advertisement. From the nine districts he had mentioned, they had received promises of support from 201 gas undertakings, added to which Australia had also come in. The total amount promised was £10,635 odd. These 201 undertakings represented 12 per cent. of the total gas undertakings in the country. But they had been promised 45 per cent. of the maximum amount asked for; and this was the reason why the Committee recommended that they should go ahead without any further delay, because they felt convinced that once the ship was launched and got under way, there would be no more difficulty, and a lot of waverers would come in. The Society of British Gas Industries would be meeting in a month's time, when they would be able to announce the amount they were prepared to contribute.

MOST ENCOURAGING.

Alderman PHILLIPS (Salford) moved the adoption of the constitution and rules as amended. He said he was very pleased to hear of the success which had hitherto attended the movement, which was most encouraging; and there was very little doubt if the rules and constitution were adopted, and they came into existence as an Association for publicity purposes, they would have a large accession of members.

A SAFE PREDICTION.

Mr. H. J. YATES (Chairman of the Society of British Gas Industries) seconded the motion. He said he wished to take this opportunity of thanking the Council of the Institution for the kind way in which they received the deputation from his Society, when they suggested certain amendments in the rules which they thought desirable in their own interests. He could not then state officially what the Society would be able to contribute; but he thought he could quite safely say it would be a substantial sum. The full meeting of the Society would not be held till the 23rd of November, when he could assure them that the Council would do their utmost to make the sum as large as possible. He must say, as a manufacturer, that he was a little disappointed that the undertakings on the gas-making side of the country had not been able among themselves to subscribe a larger sum. In his own particular business, he knew what £10,000 meant in advertising. It would not go very far; and he was afraid that at the end of the first year, unless they increased the sum, they would have a lot of the members asking what had been done with it. In his opinion, £25,000 was not too much to start with.

Mr. W. KAY (Deputy-Chairman of the Manchester Corporation Gas Committee) moved an amendment dealing with the voting power of the various subscribers to the Association, and making the minimum contribution entitled to any vote £1 per annum.

The CHAIRMAN, however, thought the Committee had, in their scheme, put forward the best basis that could be arrived at.

After some further questions had been put to the Chairman, which he answered or else referred to the Solicitor, the resolution for the adoption of the constitution and rules was carried unanimously.

ANNUAL MEETING NEXT AUTUMN.

Mr. F. W. GOODENOUGH (London) moved that the first annual general meeting of the Association be held in the Autumn of next year, at a date to be subsequently decided upon by the General Committee, and that it be held in Manchester.

Mr. JAMES W. HELPS (Croydon) seconded the motion. He thought anyone who knew anything at all about the way in which the movement had gone forward would acknowledge that it was to no small extent due to the efforts of those connected with the Manchester district. They had only to see the amount that had been subscribed by the district to appreciate the fact that some 25 per cent. of the total promised came from there. Taking this fact into consideration, it would only be right to hold the first annual meeting in Manchester.

Mr. W. E. PRICE (Hampton Wick) supported the motion. He felt that they were now, after strenuous efforts extending over eighteen months, getting on their feet, and were really making a start on the basis on which they set out. He remembered that when the matter was discussed, a few of them journeyed up to the North of England to lay the matter before the northern members. They were very cordially received, and supported in a way better even than they anticipated. Therefore he thought they could not do better than have their first meeting in the North of England.

The motion was put and carried unanimously.

Mr. E. ALLEN (Liverpool) moved: "That the existing Sub-Committee of the Publicity and Special Purposes Committee be appointed to carry out the election of the General Committee." He was pleased to have this opportunity of congratulating the

President and the Committee on the excellent way in which they had carried out the work, and in this connection mentioned the name of Alderman Phillips, who had done so much towards bringing the business to a successful issue.

Mr. JOHN YOUNG (Hull) seconded the motion, which was passed unanimously.

The CHAIRMAN then moved that a hearty vote of thanks be given to the Institution of Mechanical Engineers for coming to their aid again and lending them their most suitable room for the meeting.

This motion having been unanimously agreed to, a hearty vote of thanks was passed to the Chairman for presiding; and this terminated the proceedings.

THE DAILY PRESS AND RIVAL INDUSTRIES.

The "Engineering Correspondent" of the "Daily Telegraph" Makes Reply.

THE article that appeared in last week's issue of the "JOURNAL" has called forth one from the "Engineering Correspondent" of the "Daily Telegraph," which, we sincerely hope, he does not consider a fair reply to the one published by us. The most pleasing feature of his article is that it shows that he recognizes there is a case other than the one he put forward with an intense electrical flavour in the series of articles for which he sufficiently acknowledges responsibility. Despite, however, his reiterated protestations of a desire to see both the gas and electrical industries thrive, we still feel that his recent articles were diametrically opposed to that beneficent purpose so far as the gas industry is concerned. In our article we put a number of questions to our friend that were pertinent to the definite and dogmatic assertions that he had made. But he has entirely avoided them, and in their place we have bald statement, and a circuitous writing in regard to only a few of the questions. We should like the "Engineering Correspondent" to re-read our article, and to take up the points that he has omitted; and if there is not room for the result to be published in the "Daily Telegraph," we shall be pleased to give him the necessary space in, and publicity through, our own columns, together with the shelter of the *nom de plume* "Engineering Correspondent," provided that, in confidence, and "as a guarantee of good faith" (to adopt the old newspaper formula), he will allow his name to accompany (not for publication) the article. We hope that a sense of fairness will permit him to comply with the invitation.

Let us endeavour to clear the mind of the "Engineering Correspondent" that there is at any time any dearth of information for filling the columns of the papers devoted to the gas industry. There is no difficulty in this regard, as he can see quite well for himself by studying the extensive and varied topics with which it is necessary to deal in connection with an industry of such wide engineering scope and operating in so many markets. It is also necessary for the technical gas press, in the commercial interests of the gas industry, to watch and to deal with the claims of rival and competing industries. The gas papers would be lacking in a primary duty if they did not do so. As to the "elementary expedient of attacking the rival industry," will our friend again read carefully his own "Golden Lights" production, then with equal care note the points of our article last week, and reconsider the propriety of himself being the author of the words quoted?

"During the last few weeks," our friend now says, "the public have manifested considerable interest in the Electrical Exhibition at Olympia." Different persons ascribe different weights to the expressions they use. Certain electrical contemporaries and the exhibitors at Olympia will probably privately question the use of the word "considerable" when regarded in relation to the total expense of the display. Concerning the show being a good one, may we direct the attention of the "Engineering Correspondent" to the introductory words of our own article within three days of the opening:

> We can congratulate the electrical industry on the general character of their extensive exhibition at Olympia which was—following an inaugural banquet at the Trocadero Restaurant the previous evening—opened last Saturday by the veteran electrical expert (Sir William H. Preece, K.C.B., the President), and will continue open until Oct. 21. We can also congratulate the majority of the exhibitors upon the close completion of their stands by the opening day. They worked for most part zealously to that end; and their success is a pattern to others.

"Engineering Correspondent" is evidently unacquainted with much that is said in the columns of the technical gas press.

Of course, our friend is entitled to his personal view as to flame arc lamps being the best for street lighting; but his opinion is not that of all lighting experts. We hope that we shall hear more about those tests "which he has in mind, and which will leave no reasonable doubt in the mind of an individual unprejudiced that the arcs were the most suitable in all respects." If he succeeds in obtaining permission to publish them, we hope that all descriptive particulars of both the high-pressure lamps used and the flame arcs will accompany the statement, in order that they may be examined so as to leave "no reasonable doubt" lingering in our minds. But in connection with this matter, our friend does not tell us what he thinks of the latest installations of high-pressure lighting in Whitehall and elsewhere, nor has he told us his views as to the supersession of electric lights by high-pressure gas-lamps in many important shopping districts in and round about London. We hope that justice will induce him to investigate the matter—not through electrical sources only, but through the gas companies concerned, so that he may present both sides of the question. This would be far better than quoting from a circular of purely electrical origin as to the costs and candle-feet of lighting 55 and 80 feet of shop frontages at Woolwich. There are many important particulars absent from the Woolwich statement as presented by the "Engineering Correspondent" which we should deem requisite before accepting the circular as "confirming" any "belief that flame arcs are superior to high-pressure gas." But the "Engineering Correspondent" admits that the circular as it stands "confirms his belief." Very well. Perhaps he will send the circular to the South Metropolitan Gas Company, and ask them for their views on the subject, in order that "the Woolwich electricity supply authorities may be exposed."

But these little Woolwich figures gathered from a circular of electrical origin are brought by "Engineering Correspondent" into contrast with the figures we published last week (at the foot of the first column of p. 93) relating to the public lighting of Westminster. If our friend is not satisfied with the statement made by us, in the criticism of his article last week, that "the costs were worked out from the official tests of the city authority," he can write to the most independent and authoritative quarter of all, and ask whether the official figures have any foundation in fact. We want him to be satisfied by the very best of confirmatory evidence, as he does not appear prepared to publicly give us much credit, on our own statement, for veracity, while accepting an electrical printed circular as confirmation of his own belief.

Respecting the question of a prejudiced leaning, the "Engineering Correspondent" again proclaims his desire "to see both of the great industries flourish." But as his views are apparently settled as to the superiority of flame arc lamps, and as he remarks that, "to be quite frank, we should much prefer to see all indoor lighting done by electricity and the current applied to other purposes," it is clear he would not, if he had his way, leave much for the gas industry to flourish upon. Therefore, we have to be very thankful that the destinies of the gas industry are not in the hands of the "Engineering Correspondent" of the "Daily Telegraph."

In view of our last week's article, it is only fair that we should, for the information of those of our readers who have not seen yesterday's "Daily Telegraph," quote the article of "Engineering Correspondent." We do hope, however, that he will deal with the points that he has missed which were raised, as the result of his original article, in our colums last week, as well as with the further points in the present one. We do think that this is an occasion when we can ask for, and expect, the fullest justification from a paper of the position of the "Daily Telegraph" for statements made through its columns to the public that are detrimental to a large national industry, with millions of money invested in the country, employing an army of labour, and fulfilling a public service of which the industry itself is very proud.

RIVAL INDUSTRIES.

By the Engineering Correspondent of the "Daily Telegraph."

[Published in the "Daily Telegraph," Oct. 16.]

It used to be said by engineers that when the technical papers found it difficult to fill their pages they commenced a discussion on technical education. That always provided them with many correspondents and various views. [Of course, everyone does not agree about the best method of educating an engineer; most men think that their own particular training is the best that could possibly be devised.] We are, however, almost inclined to think that when the journals devoted to gas and electrical engineering do not know how to fill their columns, they fall back upon the elementary expedient of attacking the rival industry. We do not expect that the millennium will ever dawn when the electrical journal praises gas, or when the gas journal points out the advantages of electricity.

During the last few weeks, the public have manifested considerable interest in the Electrical Exhibition at Olympia. The writer has recently pointed out that this branch of applied science has made advances. Even the most biassed opponent would fail to convince a fair-minded individual that the present electrically-operated trains of the Underground are not preferable to the old steam-trains. Electricity has advanced in other directions, and we think that the unprejudiced individual who visits Olympia will say that there is a really good show of interesting domestic appliances. That, however, is not the view taken by some of those who speak for the gas engineers.

WHITE AND GOLDEN LIGHTS.

We have been asked by those who have the interests of the gas industry at heart to give prominence to numerous points in connection with gas lighting. One of them is Dr. Marchant's statement about electric flame arcs. He says: "With one exception these lamps all give off a good deal of fume and vapour, which make them unsuitable for indoor lighting." Since that statement is made by the Professor of Electrical Engineering in the University of Liverpool, we certainly think that it is a point to bring to the notice of the public and the makers of the lamps. We think it desirable that such facts should be known. It is only right to add that arc lamps are seldom used for indoor illumination. It is, of course, quite possible that the electrical manufacturers have a reply to Dr. Marchant's assertion.

The gas engineers take exception to the praise which the writer bestowed upon the electric flame arcs for street lighting. It was not explained by the writer that he has been privileged to witness tests made upon this subject of electric arc lighting, and the use of high-pressure incandescent gas; and he has formed the opinion that the flame arcs are superior to gas. It is quite true that the matter of costs will be a variable one in different localities. At the same time, one case which he has in mind could leave no reasonable doubt in the mind

of an individual unprejudiced that the arcs were most suitable in all respects. The tests were, at the time, considered private; but the writer will do his utmost to persuade the authorities concerned to make them public. He will willingly peruse, and probably make use of, other tests which he considers are authentic.

A Question of Cost.

Our attention has been directed to some figures concerning the lighting of Westminster which appear in one of the gas journals. It should be said at once that the figures are simply stated; it would have been an advantage if the full data, and the name of the authority who conducted the tests had been also published. However, here are the figures. Electric lighting cost £555 per mile per annum; high-pressure gas cost £825 per mile per annum; while the cost for low-pressure gas was £210. When we come to the candle-power per mile, we find that electric light gave 11,911; high-pressure gas, 96,891; and low-pressure gas, 9589. Comparing the cost per candle-power per annum, we have (according to figures given) electric lighting 11·38d.; and high-pressure gas 1·84d. "Under the circumstances," a reader might well say, "there is no doubt that high-pressure gas wins." And yet we are still unconvinced—although open to conversion. Let us turn to other figures.

A circular headed "Gas *versus* Electricity at Green's End, Woolwich," was recently issued broadcast in that locality. It states that the cost of lighting a frontage of 55 feet by high-pressure gas was £45 per annum, while the cost of lighting a frontage of 80 feet by flame arc lamps was £32 per annum. The average illumination, 12 feet from the shop front, was: With gas, 5·0 foot-candles; with electricity, it was 5·5 foot-candles. These figures confirm the writer's belief that flame arcs are superior to high-pressure gas. It is quite open for the gas companies to say that the figures are incorrect. If it can be proved that such is the case, then the Woolwich electricity supply authorities should certainly be exposed. The remedy is surely open to the gas company.

As to the light itself, we find on the circular that the gas gives a light "rather green in colour;" while electricity gives a light "pearl-white." That is, of course, an opinion. The above figures are however, facts, and should be publicly denied if not correct.

A Neutral Position.

It is, we confess, an extremely difficult matter to maintain a neutral position in controversies such as rage between the rival industries. It is the desire of the writer to see both of these great industries flourish. Advocates would be well advised to spend some of the energy now wasted in recriminations upon improvements and developments. We want Britain to lead in gas and electrical engineering. We desire to see both industries flourish. It is, of course, almost certain that at no distant date the electrical engineers will complain that the gas people are being unduly praised. Indeed, the humorous part of the matter is that several of the electrical men have said some very hard things about the lack of enthusiasm shown by the writer for their exhibition.

We are quite willing to acknowledge that the gas managers have been, in many cases, more enterprising than the electrical engineers; and the latter might well take advantage of the example set them. To be quite frank, we should much prefer to see all indoor lighting done by electricity and the current applied to other domestic purposes. But, of course, the question of cost must be considered. These changes cannot be made suddenly; and there will be many further developments before it can be claimed that, for lighting, gas or electricity is always the cheaper under any circumstances.

We cannot leave free from blame the gas and the electrical commercial interests and journals in this matter of costs. There is little advantage in the wearying vituperation of opponents with which some of the trade journals fill their columns. For that reason we commend to the reader the "Gas World" remarks on the Olympia Exhibition. Of course, they are critical; but they are not spiteful. We want official and independent tests and full data. It is far from easy to obtain authentic figures upon the subject. It should be a perfectly reasonable matter to make comparative tests by independent experts, and we hope that it will be possible to arrange for these to be made.

No doubt our gas and electrical friends are of one mind on the question of coal. They will agree with us that the ordinary householder will be well advised to try some other method than coal for heating and cooking. In a large number of cases gas only is available for cooking purposes; and in others the cost of the current is too great for the price of electric cooking to be below that of cooking by gas. As for the present Electrical Exhibition, we sincerely hope that the public have been interested. We know of the great progress of electrical firms abroad; and we want the industry in this country to be stimulated. We hope that the public will see the latest devices of applied science, whether in the gas company's show-rooms or at the Electrical Exhibition. We may say, at once, that we shall be always glad to have extracts, or scientific papers (such as that by Professor Marchant) sent by gas or electrical engineers. It is obviously impossible to notice all the latest inventions and tests in engineering work; but the writer is always pleased to receive professional papers read before the technical societies.

Glover-West Vertical Retorts at Work at Rochdale.—The Chairman of the Rochdale Corporation Gas and Electricity Committee (Mr. Walker) has issued invitations to members of the Committee and others to be present at the formal inauguration of the installation of Glover-West vertical retorts at the gas-works on Wednesday, the 25th inst. The installation, a description of which was given in the "Journal" for the 2nd of May last (p. 282), is capable of carbonizing 100 tons of coal and producing upwards of a million cubic feet of gas daily. The estimated cost of the plant was £18,000; but financial provision had to be made for the foundations, a new high-level approach and coal-store, as well as a new chimney-stack—these items bringing up the total amount to £25,000. The new retorts have been set to work, and it is reported that the results so far have been eminently satisfactory.

GAS STOCK AND SHARE MARKET.

(For Stock and Share List, see p. 196.)

The Stock Exchange has had a rather pleasant week of business; markets being apparently determined to ignore the croakings from quarters interested in depressing them. And this was the more remarkable, since to the existing Tripolitan, Moroccan, Portuguese, and other troubles abroad, was now added the Chinese movement, with its enormous potentialities for the future. Thus emboldened, most departments were firm, and some made a more or less considerable advance. It was account week; and the settlement is believed to have run smoothly. The opening day was rather languid, with some closing of accounts and some uneasiness as to labour unrest; so that prices were rather easier. On Tuesday, brighter views prevailed. Rails recovered their position, Americans improved in strength, the Foreign Market was quite firm. The tone on Wednesday was decidedly cheerful. Moroccan affairs were regarded more hopefully, and Rails extracted comfort from the new Industrial Council project, though perhaps one fragment of protection for Free Labour would be worth more than masses of multiplied councils. However, all the leading markets had a happy day. The tendency was still quite buoyant on Thursday—all the tempestuous elements being regarded with calmness. Consols rose $\frac{1}{8}$, Rails were in demand at higher figures, and the Foreign Market good generally, except for Chinese bonds. Friday was not so uniformly strong; but Consols were full of push, and rose $\frac{5}{16}$. The rise in Rails reacted slightly. Saturday's tone was pretty fair, though one or two spots were not very strong. Consols were in good demand and rose $\frac{1}{8}$, closing at $77\frac{7}{8}$ to $77\frac{7}{8}$. In the Money Market, the supply was perhaps more plentiful than ever, and low rates ruled. Discount terms grew harder, but relaxed before the close. Business in the Gas Market was good; and the activity of the previous week was well maintained. A fair number of quotations advanced; but one or two issues were rather easier owing to special circumstances. In Gaslight and Coke, the ordinary was quite active, and was unchanged. All transactions marked were within the limits of $104\frac{3}{4}$ and $105\frac{1}{2}$, with an odd lot at $104\frac{1}{2}$. The secured issues were busier. The maximum changed hands at $85\frac{1}{2}$ to 86 (a rise of $\frac{1}{2}$), the preference at $102\frac{3}{4}$ to 104, and the debenture at $80\frac{1}{2}$ and $80\frac{3}{4}$. South Metropolitan was very quiet at $116\frac{3}{8}$ to $117\frac{1}{4}$, excepting for one special deal at 116. The debentures made 80 and $80\frac{1}{8}$. In Commercials, the 4 per cent. was marked at $110\frac{1}{2}$ and $111\frac{3}{4}$ (a fall of 1), the $3\frac{1}{2}$ per cent. at 106, and the debenture at $76\frac{1}{4}$. Among the Suburban and Provincial group, Alliance and Dublin realized from $82\frac{1}{2}$ to $83\frac{3}{4}$ *cum div.*, Brentford old 260 and $260\frac{3}{4}$, Brighton original $219\frac{1}{2}$ and $220\frac{1}{2}$ (a rise of 1), ditto ordinary 158, British 45, ditto debenture $94\frac{1}{2}$, Southampton $108\frac{1}{2}$ free, South Suburban preference 116, and ditto debenture $121\frac{1}{8}$ free. On the local Exchange, Liverpool "A" was done at 218, and rose 1. In the Continental companies, Imperial was a shade firmer at $182\frac{1}{2}$ to $183\frac{1}{2}$ (a rise of $\frac{1}{2}$), and ditto debenture made 91. Union had a fall of 5, and changed hands at from 80 to 86; ditto preference marked 135 and $136\frac{1}{2}$, European from $18\frac{7}{8}$ to $19\frac{1}{8}$, and Malta 5. Among the undertakings of the remoter world, Bombay was dealt in at $6\frac{3}{8}$, Primitiva at $7\frac{7}{16}$ to $7\frac{9}{16}$, ditto preference at $5\frac{3}{16}$ and $5\frac{5}{16}$ (a fall of $\frac{1}{16}$), and San Paulo preference at $12\frac{1}{4}$.

OBITUARY.

The Corporation of Liverpool have lost a distinguished and much-respected official by the death last Tuesday, in his 72nd year, of Mr. R. C. F. Annett, the Chief Clerk and Assessor of Water Charges. He had been ailing for some time, but he was discharging his duties as usual at the Municipal Offices on the Saturday before his death. Deceased began his career with the Corporation in 1881, when he was appointed clerk of works for the Vyrnwy water undertaking, on the recommendation of Mr. Hawksley and Dr. Deacon, the Engineers. He had charge of all the expenditure connected with the contracts for the vast scheme, and the infinite details of the construction of the great masonry dam. His death reduces to two or three the number of Corporation officials who were in the service when the Vyrnwy water scheme was commenced. Mr. Annett fulfilled the duties of Managing Clerk until 1892, when he was appointed Chief Clerk in the Water Department, in succession to Mr. John Evans.

The death occurred last Thursday morning (as the result of an operation) of Sir William John Crossley, Bart., head of the well-known firm of gas-engine makers of Manchester. Sir William was born in 1844, and was educated at the Royal School at Dungannon and at the University of Bonn. He entered the machine-works of Sir W. G. Armstrong at Elswick, and remained there until, at the age of twenty-three, he joined his brother, the late Mr. F. W. Crossley, in an engineering firm in Manchester. In 1876, the partners bought and improved the German patents of Dr. Otto, and began business as gas-engine manufacturers. Their success in making small motors led to a rapid expansion of their business, and they then erected the large works at Openshaw. In addition to his business, Sir William Crossley found time for much public work. He was one of the promoters of the Manchester Ship Canal, of which he was a Director. In 1903, the freedom of the city of Manchester was conferred upon him in recognition of his public services; and two years ago he was created a baronet.

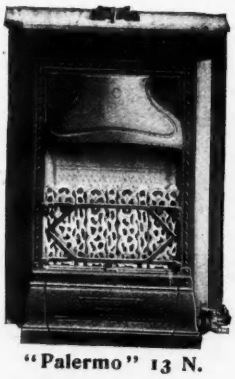
THE "FLETCHER" GAS FIRES

FOR THE COMING SEASON.

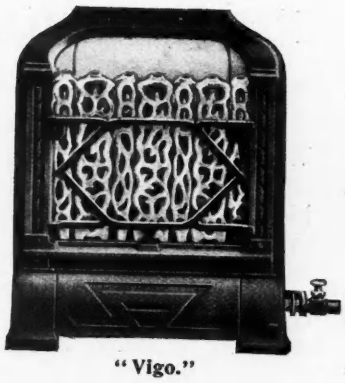
"Como" A.

"Ivor" P.

"Como."



"Palermo" 13 N.



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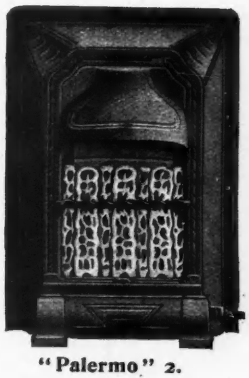
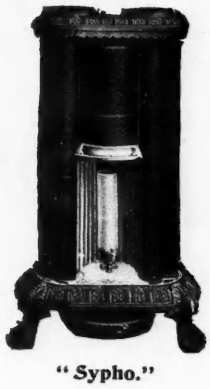
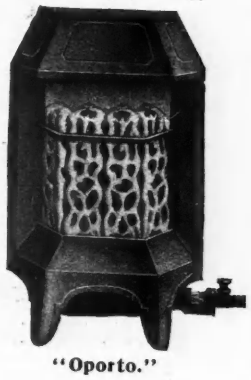


"Palermo" 2.

"Borneo" 2.



"Sypho."



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Prices from 12/6 upwards.

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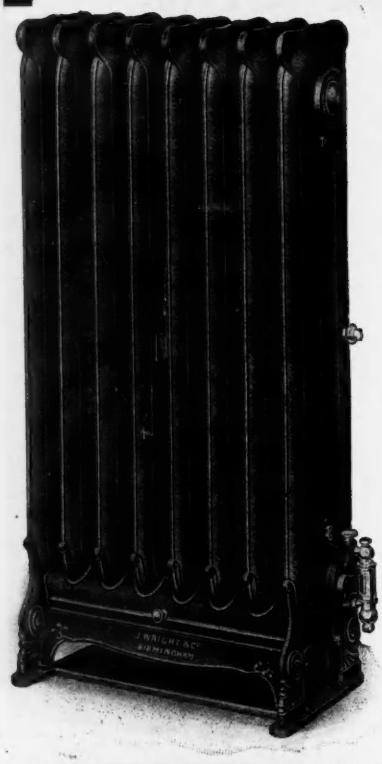
AND
HOT WATER RADIATORS.



THE OUTSTANDING MERITS OF THE
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Have been so universally recognized that the sales, even thus early in the season, bid fair to exceed the previous phenomenal records. We have anticipated this by very large stocks of the various patterns and sizes—orders for any number can therefore be promptly executed.

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FOR HEATING GARAGES, &c.

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The "GARAJO" GAS-HEATED BOILER.

Supplied complete with Radiators and Connections suitable for any purpose.

Supplied also with 4-inch Hot-Water Piping and Expansion Box ready for fixing.

THE great success that this new type of Boiler met with last season more than realized our most sanguine expectations. This year some slight improvements have been effected, making the **"GARAJO"** even more convenient to instal and use than before.

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ELECTRICITY SUPPLY MEMORANDA.

Internal Troubles—From Bastian's Hot-Box—Domestic Economy—Cheaper to Cook by Electricity than by Free Gas—Electricity the Sole Hope of Owners of Unlet Property—Marylebone and the Electrical Contractors.

THERE is an unseemly amount of quarrelling going on in the electrical industry just now. The electrical papers have been saying certain things about each other, because some have been telling the truth, while others were trying to hide it, regarding the attitude of the public towards the exhibition at Olympia. The promoters, too, have been very sore with those who ventured to speak out. The exhibition itself is a demonstration of the acute competition that exists in the electrical industry. We have had poured into our ears some nice tales about competitors' goods—as to where the weaknesses are to be found in other makers' wares, and as to what are the merits of our informant's own goods. Visits to the stands of the other competitors have levelled-up matters again. But it requires quite a lot of expert judgment to arrive at the truth. So much so has criticism of competitors' goods been going on during the exhibition that the other competitor gas—gas, with all its vileness and shameless obesity in popularity—has been at times almost forgotten. Then there are rumours of litigation between lamp manufacturers; and further the Sheffield Corporation are, now the Long Vacation is over, to take their trial, at the instance of the Electrical Contractors' Association, for doing those things in the way of wiring and so on that it is thought by the local traders they ought not to do. This all shows that there is a sort of civil war going on in the electrical industry.

But the exhibition, and how to get the public there, is the main topic. In addition to the newspaper articles and advertisements by the promoters, some of the exhibitors themselves have been expensively advertising in the Daily Press—with the double object of attracting the public to Olympia and to the advertisers' special goods. One of these advertisements comes from the Tricity cooker people. Notwithstanding the regrets of our technical papers as to the absence of the public from Olympia, the advertisement speaks of the enormous interest that is being evinced in the cooking demonstrations at the exhibition. We referred to the "interest" last week. But this shows, we are told, that "the public have at last awakened to the fact that they have too long adhered to primitive methods." How terrible this awakening must have been. We cannot wade through the column advertisement; but we can see pretty well what it is all about from the cross-lines—"Gas Fumes Injurious," "Electricity Supersedes Gas and Coal," "Hygiene and Economy," and "A Great Invention." It is imperative that the public should be amused. Life would be very dreary if it were all business and competition; and the electric cooker people are certainly helping to intermingle fun with trade. Some unkind people would write "sophism" where we have written "fun."

Perhaps it is our loss that we do not intimately know Mr. C. Orme Bastian; but we are not, at the moment of writing, altogether struck with the cleverness of his mode of argument any more than we are with the professed miraculous utility of his hot-box invention. He has directed a letter to the "Electrical Engineer" concerning the recent criticism made in the "Memoranda" of the hot-box, which is to revolutionize the prospects of electric heating and cooking, according to the prophets who have interested themselves sufficiently in the matter, to be, according to their lights, persuaded that there is something in the hot-box. Mr. Bastian remarks that the writer of the criticism professes not to understand that a system of thermal storage should reduce the cost of electricity to the consumer. We not only profess that, but it is a present deep conviction that the hot-box will not reduce the cost to the consumer, and that it will not prove a very practical contrivance for its destined purpose. We know all about current leaking into the storage-box during the slack period, and of the advantages to the electricity station of the levelling-up of a consumer's load. But we look to the box itself. It is one thing to have thermal storage; it is quite another thing to utilize this storage without loss just as one requires, and it is impossible to utilize the stored heat, in the manner proposed by Mr. Bastian, so as to regulate the temperature exactly as needed. If we are wrong, then we shall be pleased to acknowledge it when satisfied to the contrary. The means proposed for utilizing the temperature, as we understand, is by passing air through the hot-box, and directing the heated air to wherever, or to whatever purpose for which, it is required. Now, from the first heat absorption by the air, the heat available in the hot-box must begin to diminish, and will continue on the down-grade so long as air is passed through. How under such circumstances there is to be temperature regulation passes our comprehension; or how a given temperature is to be maintained we cannot see; or how heat losses are to be prevented in the transit of the heat to the place of utilization, our intelligence will not allow us to grasp.

Mr. Bastian states that we take refuge behind that favourite platitude of the gas interests that the thermal value of 6 cubic feet of coal gas is equal to that of a whole unit of electricity. Let us put it another way. The proof of the calorimeter is that 6 cubic feet of coal gas purchased by the consumer is capable of generating as many B.Th.U. as 1 unit of electricity. Evidently, however, Mr. Bastian does not believe in this elementary and demonstrable fact. "For many years," he writes, "I really believed there was some practical truth in this contention, because [mark the profound philosophy and logic in the statement] there was a small index on my gas-meter with the inscription underneath '·5 foot per revolution.'" What manner of man is this who confesses that the rating of the revolution of the drum of a gas-meter was sufficient ground, as he confesses it was, for his belief as to the equality in thermal value of 6 cubic feet of gas and 1 unit of electricity? Then he makes a fantastic charge, in which he hints at this "·5 foot per revolution" being put there to deceive the public as to the actual rate at which they are using gas. Was anything more absurd written by man on this particular subject? He states that actual tests showed that the inscription should have read "5 feet per revolution." Now, Mr. Bastian, we have a meter near by where this is being written, the casing of which measures 2 ft. 9 in. by 2 ft. 1 in. by 1 ft. 5 in. (that is a large, and not an ordinary domestic, gas-meter); and this meter is rated "2½ feet per revolution." We should like to know the size of the meter that our critic refers to that was marked "·5 foot per revolution," and showed by actual tests that it should have been "5 feet per revolution." Mr. Bastian has been satisfied that for boiling water electrical energy at ½d. per unit is slightly cheaper than gas at 2s. 6d. per 1000 cubic feet, and that cooking can be effected much more satisfactorily and more cheaply with electricity at 1d. per unit than with gas at 2s. 10d. per 1000 cubic feet. But then this is Mr. Bastian whose actual tests showed that the inscription on a gas-meter rated at "·5 foot per revolution" should have read "5 feet per revolution," and to whom it seems that the "decimal point is calculated to greatly deceive the public as to the actual rate at which they are using gas."

We raise our hat once again to "Maud." We do not know whether to call her "Miss" or "Madam." We like her when she is candid; but it will be necessary to offer up supplications for her if she continues to rake about among the grim untruths and unrealities that electrical commercialism has strewn about the pathways of the gas industry. She now tells a story composed of much that has been said in other words before—so often, in fact, that the wonder is the "Electrical Review" did not relieve its readers from the parts of Maud's articles that must, long before this through reiteration, have sunk deeply into the souls of its readers. We will not on this occasion touch critically upon anything that Maud has to say—not even upon those fumes which "when breathed in large quantities are most injurious to health"—but we will exercise restraint to the extent of extracting from her article the costs quoted per week for cooking and heating by electricity in a house the rental value of which is between £30 and £45 a year. We are not going to admit that Maud's figures are correct; we are only going to take them as they are, multiply them by the number of weeks in the year, and leave them to bear witness as to how far they justify her assertion that electricity "when introduced into the house will immediately effect untold savings." In short, Maud shall herself show the economic fallacy that is underlying her argument. We have one criticism to make, and it is that Maud has not told us how many hours a week, on the average, she allows for the heating, though she tells us that she prices the electricity at 1d. per unit, and that *the costs are the averages per week over the whole year.* The average per week over the whole year is a little bit of cunning that does credit to Maud's business capacity. The figures per week are Maud's; ours are the totals—

For Heating.	Per Week (Average for the Year Through).			Per Year.		
	s.	d.		£	s.	d.
Dining-room	3	1	=	8	0	4
Drawing-room	1	9	=	4	11	0
Kitchen (heating only)	1	1	=	2	16	4
Hall and bedrooms		7	=	1	10	4
				16	18	0
Cooking	3	6	=	9	2	0
				26	0	0

Now, Maud, is that economy for a householder who can only afford to pay a rent of £30 to £45 a year? This does not include lighting the house or heating the water for baths for father and mother and the children. Perhaps they do not want washing after gas is superseded by electricity. It does not allow anything for the "copper" on washing-day; and it does not allow anything for waste, which has a financial value to the purveyors of all commodities. It does not allow for anything beyond the rigid prescription of Maud; and it amounts at that to £26 per year. When all is included that Maud has excluded, the account for electricity looks like totalling up to something as much as the rent and rates and taxes combined.

One chart and about seven-and-a-half columns of figures and words (some of the figures we recognize as old acquaintances) are published, in the "Electrical Review," by Mr. R. Borlase Matthews, Wh.Ex., M.I.E.E., author of that remarkable book "Electricity for Everybody," to assure the electricity industry that joints of meat have a far greater preference for electric-ovens than for gas-ovens, and also submit to being cooked in the former at a cheaper rate than in the latter. That is a very considerate attitude for the joints to take towards electricity. However, it is hardly worth while devoting space to discussing the matter with such a pure enthusiast as the one who boldly

appends his name to this very extravagant statement: "It is an interesting *fact* that, if coal or gas cost nothing, it would still be cheaper to cook a joint of meat in an electric-oven, and pay a comparatively high rate per unit for electricity; for the loss due to the process of electric cooking is so slight as compared with that sustained when gas and coal ovens are employed, that a very considerable saving is effected on the butcher's bill, so much so that, after paying for the electricity, and assuming that nothing was paid for gas or coal, the housekeeper would still have money in hand." We must really get our friend Maud to show Mr. Borlase Matthews her computations. We do not suppose for a moment that, after paying for electricity, as suggested by Maud, the ordinary tenant of the £30 to £45 house would have anything left to pay for gas or coal, and so would be an undesirable customer for the gas company or the coal merchant. Therefore Mr. Borlase Matthews need not worry about enforcing his point by further wild statements. By the way, will that gentleman kindly furnish us with the names of the makers and the types of gas-cookers used in the tests that were made by him; and the same information in regard to the electric cookers that he used would be serviceable. As he probably knows, there are gas-cookers and gas-cookers, just as there are tests and tests, and electrical engineers and electrical engineers, and so forth.

We suppose that, with the close of the costly public failure at Olympia, there will be an easing-off of the torrent of light talk about the magnificent wonders of electricity in the household. "Our Engineering Correspondent" of the "Daily Telegraph," to whom a few inquiries were addressed in an article in last week's issue, (p. 93), has had another turn at cooking by electricity. But he left gas out of the question on this occasion, and devoted himself to contrasting the use of electricity and coal in the kitchen. Among his *obiter dicta* is this:

> If the landlord has thoughtfully provided electric light in the house, you can easily give electric cooking a trial. If the landlord in a house in a district where electricity is supplied does not have that convenient source of light, heat, and power available in his house, he will shortly be unable to let it. That is a point for owners of property to notice. It is useless to moan about an empty house unless the fittings are up to date. A supply of electricity is now reckoned by the wise to be as great a necessity as a supply of good water.

Now we hope "Our Engineering Correspondent" will believe us when we say that gas undertakings have had experience of landlords who have not been able to let electrically-wired houses until they have had gas-pipes installed; they have also had experience of houses the tenants of which, after using electric lighting, have returned to gas lighting; and we know of electrically-wired houses that are empty to-day, while next door gas-piped houses are tenanted. What is of importance to the gas industry, too, is that its business continues to expand. Even in literary work and the advocacy of "Engineering Correspondents," "*mediocria firma*."

There has been a long discussion in the Marylebone Borough Council over the position of the Sales Department of the electricity undertaking; and financially the department has been whitewashed by an investigating Joint Committee, who have made deductions from the expenditure charged against it as being fairly chargeable to the electricity undertaking, and have readjusted other items. That is excellent—for the Sales Department. It is clear the local electrical contractors are not likely to obtain much relief from the competition of the department under the present administration, though the Electricity Supply Committee have expressed a willingness to receive a deputation of members of the Electrical Contractors' Association who are ratepayers in order to discuss "misunderstandings."

The New Engineer for East Greenwich.

The Directors of the South Metropolitan Gas Company, at their meeting last Wednesday, appointed Mr. F. J. Bywater, of the Saltley Gas-Works of the Birmingham Corporation, to the position at East Greenwich shortly to become vacant by the retirement of Mr. Tysoe. The Secretary of the Company (Mr. F. M'Leod), in communicating the news, wrote: "At the meeting of the Institution of Gas Engineers held in 1908, Mr. Carpenter highly complimented Mr. Bywater upon the excellence of his paper on refractory materials; and it is not improbable he may have borne this in mind when the final selection for the post was made."

"Boilers and Boiler Control."—We have received from the publishers, Messrs. Davis Bros., of Danes Inn House, Strand, a little book bearing the above title. It is a handbook for firemen and boiler engineers, by Mr. John B. C. Kershaw, F.I.C., with an introduction by Dr. E. W. Hope, Medical Officer of Health for Liverpool. The author is Lecturer upon Smoke Prevention to the Liverpool Sanitary Science Instruction Committee, and the contents of the book are based largely upon a series of articles on "The Theory and Practice of Steam Generation," and on notes of various lectures on "Smoke Prevention and Fuel Economy" delivered in London, Liverpool, and Warrington. The information contained in these articles and lectures has been corrected and brought up to date, and arranged in the present form for convenience of reference. The author expresses the hope that his work, in which will be found the underlying principles governing the correct combustion of fuel, may in some small degree reduce the quantity of smoke emitted from chimneys, and bring nearer attainment efficiency and smokelessness in combustion. The price of the work is 1s. net.

MODEL BILLS AND CLAUSES.

Some Amendments.

THE Model Bills and Clauses as amended for next session have lately been issued. They differ in only a few respects from those for 1910-11; and these it may be of interest to notice.

In the Model Gas Bill, there is a new clause giving a company power to lay pipes in private streets, on the application of the owner or occupier of any premises within the limits of the Act abutting on, or being erected in, any street laid out but not dedicated to public use, and to supply such premises with gas. The clause fixing the period for the sale of superfluous lands is omitted. The wording of the clause that gives a company power to supply gas-fittings, &c., has been slightly altered. As it now stands, the company may "purchase," sell, let for hire, &c., appliances for "lighting, motive, heating, ventilating, cooking, or any other purpose." In the former Model Bill, the word "purchase" was not included; and in place of the words above quoted the clause ran, "for lighting, for motive power, for the warming and ventilating of houses and buildings, for the cooking of food, and for all other purposes for which gas can or may be used." In the same clause, the following words, applicable to the Bills of local authorities, have been inserted, in substitution for a sub-clause in the former Model Bill:

> The corporation may enter into contracts for the execution of any of the powers of this section, and shall not themselves lay any pipes on the consumer's premises except between the main of the corporation and the consumer's meter; nor shall they sell any such gas-fittings as aforesaid except through a contractor.

Among the miscellaneous provisions, those giving local authorities power to supply electrical fittings have been amplified by the insertion of a sub-clause similar to the above, prohibiting the wiring of consumer's premises and the sale of fittings except through a contractor.

The long section of the old Model Bill giving a company power to issue share warrants and debenture stock certificates to bearer is omitted.

The Model Water Bill does not call for notice.

GAS ACTS FOR 1911.

[FIRST ARTICLE.]

IN reviewing the Gas Acts passed during the session of Parliament still unexpired, we shall pursue our custom of dealing with those companies first who have now attained, through the measures before us, full statutory status. The Bills, as lodged, were noticed in the "JOURNAL" for Jan. 3 last; and in the review we shall devote ourselves principally to showing any variation from the powers sought, and then described.

The Ashborne and District Gas Company have secured the extension of the limits of their area of supply as desired. The capital of the Company has been reduced from the £35,000 proposed in the Bill to £30,000, of which £20,000 is original capital. Of the £10,000 of additional capital, the issue of preference shares or stock is limited to £5000. Borrowing powers are allowed to the amount of one-third part of the issued capital. It was in the Bill contemplated that the standard rates of dividend should be 10 per cent. on the original capital, and 7 per cent. on the additional capital; the rates are now respectively 8 and 5 per cent. Special purposes and reserve funds are granted; and, in respect of the former, the carry-forward of divisible profits is limited to an amount not exceeding the sum required to pay a year's dividend at the authorized rates. In clauses for the protection of the Derbyshire and Staffordshire County Councils, it is agreed that seven days' notice, instead of three, shall be given in respect of the breaking-up of streets for the laying of pipes (save in the case of services and emergencies); and a description of the work is to be lodged, with a plan, at least fourteen days before the breaking-up of a main road or main road bridge commences. There are restrictions as to the length of road to be broken up; and, where reasonably practicable, at least 12 feet of metalled road is to be kept clear for the use of the public. The price to be paid by the Company for surface reinstatement of main roads is to be an amount calculated at 2s. 6d. per square yard in the case of a road made of granite or tar macadam; at 1s. 6d. per square yard in the case of a road made of slag or limestone; and in the case of other roads, such expense as the Councils may reasonably incur in restoring the surface. The Councils are to be exempt from liability to damage to the property of the Company by the use of a steam or other roller not exceeding 15 tons in weight. The London and North-Western and North Staffordshire Railway Companies have also obtained protection. The standard price has been altered. It was originally proposed that in Ashborne it should be 3s. 9d., and in the outer area 4s. 3d. per 1000 cubic feet. It is, however, to be 3s. 4d., with the right to charge 6d. additional outside Ashborne. The dividends are to vary by 4s. per cent. on the 8 per cent. capital, and by 2s. 6d. on the 5 per cent. capital in respect of penny changes in price. The standard illuminating power of the gas is 14 candles, tested by the "Metropolitan" No. 2 burner. The discounts clause has very properly disappeared; the extension in the ordinary manner of section 13

of the Act of 1847 now sufficing. Power is given to the Company to apply for an Electric Lighting Order. A purchase clause also appears in favour of the District Council, operative only in the next session of Parliament. Special provision is made in regard to capital expenditure until the fate is known of the power conferred upon the Council to apply for purchase authorization. [*Parliamentary Agents: Messrs. Hargreaves and Crowthers.*]

What has hitherto been known as the Chapel-en-le-Frith, Chinley, and District Gas Company, Limited, will in future be recognized as the Chapel Whaley and District Gas Company; there having been certain changes effected during the course of their measure through Parliament, whereby the Whaley Bridge Gas Company, Limited, will cease to exist. The limits of supply are minutely described in the Act; and in connection therewith, the gas powers of the Buxton District Council, in their Acts of 1870 and 1873, within the parish of Fairfield have been determined. Provision is made for the sale, if required, after the expiration of 25 years, to the Yeardsley-cum-Whaley District Council, of the portion of the undertaking in their administrative area; and to the Chapel-en-le-Frith Rural District Council powers of purchase of parts of the undertaking in their area are given, operative at any time—subject in both cases to authorization being obtained from Parliament or the Local Government Board. The Company receive authority to carry on their present works, as well as those of the Whaley Bridge Company. The capital proposed in the original Bill has been increased, in consequence of the changes, from £40,000 to £45,000, of which £25,000 is additional capital, one-half of which is to be the limit of the issue of preference shares or stock. The usual one-third borrowing sanction is conferred. The standard rates of dividend are to be 6 per cent. on the original capital and additional ordinary capital and 5 per cent. on the preference capital. The Derbyshire and Cheshire County Councils have road-protection—among the provisions being one exempting them from liability to damages for injury done by any steam-roller not exceeding 15 tons in weight. Railway Companies and the Yeardsley-cum-Whaley District Council have also secured certain protecting clauses; among the powers obtained by the latter being that pipes shall, if possible, be "laid or constructed at such a depth not exceeding 2 ft. 6 in. below the surface of such road, street, bridge, or highway as the Urban Council may reasonably direct." They too have the 15-ton steam-roller provision. The standard price is to be 4s. per 1000 cubic feet, with sliding-scale operating on the lines of 3s. increases or decreases per penny variations in price. It is enacted that the price charged for gas to premises situate in the Yeardsley-cum-Whaley district is not at any time to be higher than that for the time being charged for a corresponding supply in any other part of the district. The "Metropolitan" No. 2 burner is to be used for testing the quality of the gas; the standard being 14 candles. Power is also given to apply for an Electric Supply Order. [*Parliamentary Agents: Messrs. Crowders, Vizard, Oldham, and Co.*]

The Chasetown Gas Company have had their limits of supply defined, and the full powers of an incorporated company conferred on them. The capital originally suggested has been considerably decreased. In the Bill, £20,000 was specified. It has been reduced to £11,250, divided into 2250 shares of £5 each, of which one-fourth "shall be" preference shares entitled to a preferential dividend of 5 per cent. per annum. Of the capital, 510 ordinary shares are to go to the present shareholders on the basis of one ordinary share for five ordinary shares of the limited Company. The standard dividend on the ordinary capital is to be 10 per cent. Borrowing powers are on the usual one-third scale. Regarding auditing, it is prescribed that chartered or incorporated accountants shall be engaged, and not necessarily holders of shares. The price originally proposed for gas was 5s. 6d.; it is to be 5s., subject to revision by the Board of Trade after three years, when a new maximum price may be applied, or a standard price with sliding-scale on the ordinary terms. Powers as to special purposes and reserve funds are included in the Act. The standard illuminating power is to be 14 candles, tested by the "Metropolitan" No. 2 burner. Any authority conferred upon the Lichfield Gas Company by their Act of 1878 to distribute and sell gas within the limits of supply as defined by the present Act is now repealed. The Act saves for the Staffordshire County Council or the Committee of Visitors of the County Lunatic Asylum at Burntwood the right to supply direct with gas from the asylum gas-works any houses now, or hereafter to be, erected on property purchased or to be purchased for the purposes of the asylum. As to the distribution system of the Company, notice as to the breaking-up of roads is extended to seven days; and plans are to be delivered not less, in the case of a bridge, than fourteen days, and in all cases seven days, before the Company commence to open or break up any road, or interfere with any road or bridge. Where possible, pipes are to be laid with a covering of 2 ft. 6 in. The Council are not to be liable for any claim to damage in respect of any injury occasioned through the proper use of "any steam-roller, scarifier, or other similar appliance." The Cannock Chase and Wolverhampton Railway and the owners of minerals secure protecting clauses. [*Parliamentary Agents: Messrs. W. & W. M. Bell.*]

The Act of the Chesham and District Gas Company presents us with a somewhat new face through excision and an extension. The outlining of the limits of supply has been considerably simplified, and has been reduced to a five-line clause. From the £52,000 contemplated in the Bill, the capital has been reduced to £38,000, of which £16,000 "A" ordinary stock is to be created in respect of the existing ordinary capital of £10,000, £2000 of "B" preference stock in respect of the existing preference capital, and £20,000 is the additional capital. The £16,000 "A" ordinary stock is to be divided between the holders of the present ordinary shares in the proportion of £16 of such stock for each ordinary share of £10, £8 of the stock for each ordinary share of £5, and £2 of the stock for each ordinary share of £1 5s. Of the £20,000 additional capital, it is provided that the Company shall not raise as preference stock more than £12,000. The borrowing powers are to be at the one-third rate, inclusive of £3150 already borrowed. The dividend on the ordinary capital is limited to 5 per cent.; and the preference dividend is not to exceed this percentage. Special purposes and reserve funds are allowed; and in respect of the former, the carry-forward is limited to a sum equal to one year's dividend. Protecting clauses appear in favour of the Rickmansworth and Uxbridge Valley Water Company; and the District Council have obtained protection in respect of the length of roadway to be opened for pipe-laying at any one time, and "pipes are to be laid or constructed at such a depth, not exceeding 2 ft. 6 in. below the surface of such street, as the Council may reasonably direct." Further the Council are to be exempt from liability "by reason of such work being laid at a depth below the surface of any such street insufficient for its protection from injury arising from the reasonable use by the Council of any steam-roller not exceeding 15 tons in weight." The standard price of 4s. per 1000 cubic feet proposed for application within a radius of three miles from the Town Hall has been altered to 3s. 9d. In the outer area 1s. per 1000 cubic feet more may be charged; but within this limit there may be variable charges in different parts of the outer area. The sliding-scale applies on the basis of 2s. 6d. increments or decrements of dividend, on penny reductions and increases in the price of gas. The standard quality of gas is to be 14 candles, tested by the "Metropolitan" No. 2 burner. The clause for the purchase of the Wendover Gas Syndicate, Limited, has disappeared, as well as the stand-by clauses. A purchase clause in favour of the District Council, and operative next year, has been inserted. [*Parliamentary Agents: Messrs. Torr and Co.*]

The Sidmouth Gas and Electricity Act is the last of the measures referring to the newly incorporated concerns. In this, powers for electricity supply are a prominent feature. The Company have secured the £30,000 capital asked for in the Bill, of which £15,000 is preference. The arrangement as to the distribution of profits noticed on Jan. 3 last [p. 21] has been confirmed. Inclusive of £5000 already on loan, the Company are allowed to borrow up to one-third part of the issued capital. The standard price of gas has been reduced from 4s. 10d. to 4s. per 1000 cubic feet; and the sliding-scale will apply on the ordinary terms. The illuminating power of the gas is to be 14 candles, tested by the "Metropolitan" No. 2 burner. The stand-by clause reproduced by us on Jan. 3 has been secured. A protecting clause has been obtained by the Sidmouth and London and South-Western Railway Companies, as well as by the Sidmouth District Council in regard to the opening of the streets. The Company are, in connection with their electricity supply powers, authorized to break-up certain specified streets not repairable by the Local Authority. If within three years after the passing of the Act, or within such extended period as the Board of Trade may prescribe, the Company fail *bonâ fide* to commence to exercise the electricity powers, the additional capital authorized is to be reduced from £15,000 to £7000. Separate accounts are to be kept for the gas and electricity undertakings. A purchase clause in favour of the District Council, operative next session, has been inserted. In other respects we do not notice any material alteration from the Bill as introduced. [*Parliamentary Agents: Messrs. Torr and Co.*]

The Bill promoted by the Whaley Bridge Gas Company, Limited, was not proceeded with; the Chapel Whaley Gas Company's measure, as already seen, superseding it.

Association of Engineers-in-Charge.

At the meeting of the Association of Engineers-in-Charge, which was held in St. Bride's Institute last Wednesday, Captain H. Riall Sankey, the retiring President, introduced his successor to the chair, Dr. W. H. Maw, who then proceeded to deliver his Inaugural Address. In this, Dr. Maw dealt with the development of mechanical engineering work during the last thirty or forty years; and he then went on to direct special attention to the opportunities possessed by engineers-in-charge of materially assisting in the improvement and development of the machinery and engineering appliances with which they have to deal—opportunities which, he said, are not always utilized so completely as they should be. At the conclusion of the address, Mr. A. Siemens, in proposing a vote of thanks to the President, remarked that the advance of engineering was due to looking after detail. The proposal was seconded by Mr. A. P. Trotter, heartily carried, and acknowledged by Dr. Maw. Captain Sankey was also cordially thanked—on the motion of Mr. W. H. Patchell, seconded by Mr. S. M. Singleton—for all he had done for the Association during his year of office as President.

At a meeting of the Middlesbrough Town Council last Tuesday, the Mayor (Sir Hugh Bell, Bart.) commended to the Council and to the town generally the raising of a public memorial to the late Sir Samuel Sadler.

THE WOODALL-DUCKHAM RETORT INSTALLATION AT LAUSANNE.

In previous issues of the "JOURNAL," reference has been made to the installation of vertical retorts on the Woodall-Duckham system at the new gas-works of the Lausanne Municipality, at Malley; and it may be remembered that some figures in regard to the working of these retorts were submitted by Mr. J. P. Leather, of Burnley, in the paper he read at the last meeting of the Institution of Gas Engineers. The current number of "Le Gaz" contains an article on the Lausanne installation by M. Cornaz, the Chief Gas Engineer to the Municipality, in which are given tabulated results of trials of various kinds of coals in the retorts, together with other particulars of the installation. The following is a translation of the greater portion of the article, with the tables reproduced.

The installation was decided upon in November, 1909, and was brought into use on the 9th of January last. Since then it has worked without a hitch, and has been found adequate for the gas supply of the entire city. It consists of a bench of twelve settings of four retorts, calculated for a daily production of 42,000 cubic metres (rather more than 1,483,000 cubic feet), or 3500 cubic metres (123,600 cubic feet) per setting. The building containing the installation is 155 feet long, 40 feet wide, and 70 feet high; and each setting occupies an area 10 ft. by 20 ft. Having described the action of the retorts, with which readers are acquainted, M. Cornaz explains that the rate at which the coke is drawn is variable; the extractor making a turn in from 50 to 70 minutes according to the quality of the coal and the production desired. Motion is imparted to this mechanism by an electric motor of 6 H.P., of which 2 H.P. are utilized for the six settings at present in use. Uninterrupted working is ensured by the duplication of all the motors. The electric current, which is supplied by the Municipality, can be generated on the works in the space of from two to five minutes, by means of a Diesel oil-engine of 120 H.P., in the event of the usual supply failing. But working could cease for half-an-hour with no more serious result than a slight decrease in the make of gas. The generators are fed by means of a monorail, and the clinkering is done every 48 hours.

When the installation was decided upon in 1909, the constructors of the retorts had not had any experience with the carbonization of Continental coal; so that they guaranteed the proper working of the plant only on the condition of good English coal being used. With Yorkshire coal, a yield of 33·6 cubic metres of gas per 100 kilos. of coal (rather more than 12,000 cubic feet per ton) could be obtained, of a heating power of 5073 calories per cubic metre, or 570 B.Th.U. gross per cubic foot, at 60° Fahr. and 30 inches, with an illuminating power of 15 to 15½ English candles, and a yield of 65 to 70 per cent. of coke, of which 16 per cent. would be required for heating furnaces. As a matter of fact, the results obtained in ordinary working exceed these guarantees, as shown by the following tables, the figures in which are taken from the daily reports of the works, and consequently give practical and not experimental results. In order to understand the variations in the yields of gas given, it must be borne in mind that they are based on the weight of coal carbonized as recorded by automatic weighing-machines which are not absolutely accurate; the weight being corrected daily by the percentage of error calculated once a week. Moreover, no account is kept of the coal remaining in the retorts at the time of refilling—an amount that varies. The figures which most nearly approach accuracy are those given in the stock-taking returns made at the end of each year. A coal stock sheet for the first six months of 1911 gave as the average production of gas from English, German, and French coals 34·8 cubic metres (about 1230 cubic feet) per 100 kilos. of coal, measured by the station meter, without correction. During this period, the average gross calorific power was 5370 per cubic metre, or 597 B.Th.U. per cubic foot. The following results are taken from the daily reports in regard to certain coals, used alone or mixed. For the reasons already stated, the averages give the best idea of the working of the plant.

ENGLISH COAL.

The coal employed was Aldwarke nuts, yielding, according to analyses made at the Zurich Federal Laboratory, 37·8 cubic metres of gas per 100 kilos., and 7·1 per cent. of ash. The temperatures of the settings were: At top (combustion chamber), 1210° C.; at bottom (about 1 metre from the base of the retorts), 985° C. There was little dust in the coal, which, thanks to the uniform dimensions of the nuts, made a very easy descent in the retorts, and consequently gave a good yield of gas. As the retorts had only just commenced work, none were being scurfed. This explains why the average production per setting is greater than in Table II., while the production per retort is less.

TABLE I.

Dates.	Make of Gas per 24 Hours.				Calorific Power per Cubic Metre at 15° C. & 760 mm.		Fuel Used for Heating the Settings.*
	Total.	Per Setting.	Per Retort.	Per 100 Kilos.	Gross.	Net.	
	Cub. Met.	Cub. Met	Cub. Met.	Cub. Met	Cal.	Cal.	Per Cent.
Feb. 9. .	20,310	3384	846	38·3	5463	4929	17·0
,, 10. .	20,390	3400	850	34·6	5304	4860	14·0
,, 11. .	20,590	3432	858	37·5	5553	4991	15·5
,, 12. .	20,620	3440	860	33·8	†	†	13·6
,, 13. .	19,580	3264	816	35·7	5581	4982	15 5
Averages .	20,298	3384	844	35·98	5475	4940	15·1

* Including clinker. † Sunday.

GERMAN COAL.

Coal in lumps is obtained from the Saar basin—the Altenwald Government mines, or else private mines (Merlenbach). It was a mixture of these two kinds that was carbonized at Malley. According to analyses made by the Zurich Federal Laboratory, the mixture yielded 40·6 cubic metres of gas, and 6·4 per cent. of ash. These differences, as compared with English coal, are manifested perceptibly in Table II. by an increase of 0·88 per cent. in the production of gas per 100 kilos. of coal, and a decrease of 1·9 per cent. in the fuel required for heating the settings. On the point of automatic working, it was perfect with Saar coal, and consequently each retort yielded a maximum quantity of gas per 24 hours (as much as 935 cubic metres). It is to be noted that, in the table, this production is not a maximum for the figures of the yield of gas per setting, because calculations were made without allowance for the retorts being scurfed.

MIXTURE OF GERMAN AND FRENCH COAL.

At the old gas-works, French coal was carbonized in six-hour charges and German coal in five. As the effect of this difference was to lower the daily production of gas by about 20 per cent., it was not possible to use French alone at Malley before the summer. The six settings then in use could only just meet requirements; and a decrease of production could not be tolerated, because, besides taking longer to carbonize, French coal yielded, in the laboratory tests, 6 per cent. less gas than the Saar coal—*i.e.*, 34·2 instead of 40·6 cubic metres per 100 kilos. So it was decided to carbonize German coal in three of the settings, as shown in Table II., and in the other three unscreened French coal from Courrières and Liévin; and then, after the lapse of some days, to carbonize in the six settings a mixture of French and German coals in equal proportions. The results are given in Table III. The effect of the French coal is shown by a fall in the make per retort, notwithstanding a slightly higher yield. One might have expected at the same time an equally lower yield per 100 kilos; whereas, compared with Table II., there was a slight increase (0·4 per cent.). This was obtained by working the settings rather more slowly, but to the detriment of the quality of the gas, since its net heating value was reduced by nearly 200 calories. The two distillations allowed of the settings being worked easily; but it must be

TABLE II.

Dates.	Make of Gas per 24 Hours.				Retorts under Scurfing.	Calorific Power per Cubic Metre at 15° C. and 760 mm.		Hefner Units, with Argand Burner and 150 Litres of Gas.	Fuel Used for Heating the Settings.*
	Total.	Per Setting.	Per Retort.	Per 100 Kilos.		Gross.	Net.		
	Cub. Met.	Cub. Met.	Cub. Met.	Cub. Met.		Cal.	Cal.		Per Cent.
Feb. 14	21,320	3552	888	38·0	..	5608	5028	..	14·4
,, 15	21,040	3508	877	34·5	..	5584	5019	16·9	12·5
,, 16	19,630	3271	892	35·1	2	5573	5003	17·1	15·3
,, 17	20,580	3430	935	37·3	2	5511	4945	15·7	13·9
,, 18	17,710	2952	800	34·0	2	5692	5134	16·2	14·0
,, 19	16,820	2803	840	37·4	4	5397	4825	†	15·0
,, 20	20,420	3403	930	39·3	2	5284	4760	14·2	11·6
,, 21	20,360	3393	848	37·3	..	5576	5032	16·6	10·0
,, 22	20,150	3360	877	37·3	1	5332	4783	17·0	12·5
Averages	19,781	3297	876·3	36·7	..	5506	4948	16·2	13·2

* Temperatures of the retorts: Top, 1220° C.; bottom 990° C. † Sunday.

TABLE III.

Dates.	Make of Gas per 24 Hours.				Calorific Power per Cubic Metre at 15° C. & 760 mm.		Fuel Used for Heating the Settings.*
	Total.	Per Setting.	Per Retort.	Per 100 Kilos.	Gross.	Net.	
	Cub.Met.	Cub.Met	Cub.Met.	Cub.Met.	Cal.	Cal.	Per Cent.
June 1 . .	19,570	3262	890	38·0	5220	4683	12·2
,, 2 . .	19,360	3227	842	37·8	5294	4743	14 1
,, 3 . .	19,270	3212	838	36·2	5451	4921	13·5
,, 4 . .	18,550	3092	808	36·0	†	†	14·0
,, 5 . .	19,690	3282	818	37·8	5250	4705	13·8
Averages .	19,288	3215	839·2	37·1	5303	4763	13·5

* Temperatures of the retorts: Top, 1230° C.; bottom, 1000° C. † Sunday.
Note.—Retorts under scurfing: June 1 and 2, two; June 3 and 4, one.

TABLE IV.

Dates.	Make of Gas per 24 Hours.				Calorific Power per Cubic Metre at 15° C. & 760 mm.		Fuel Used for Heating the Settings.*
	Total.	Per Setting.	Per Retort	Per 100 Kilos.	Gross.	Net.	
	Cub.Met.	Cub.Met.	Cub.Met.	Cub.Met.	Cal.	Cal.	Per Cent
June 6 . .	16,770	2795	762	35·0	5126	4623	16·0
,, 7 . .	18,120	3020	823	37·6	5185	4663	14·9
,, 8 . .	17,050	2842	773	37·0	5289	4734	14·7
,, 9 . .	17,370	2895	755	37·0	5343	4788	14·4
,, 10 . .	18,730	3121	815	37·8	5113	4602	12·8
Averages .	17,608	2934	786	36·9	5211	4682	14·5

* Temperatures of the retorts: Top, 1250° C.; bottom, 980° C.
Note.—Retorts under scurfing: June 6 to 8, two; June 9 and 10, one.

TABLE V.

Dates.	Make of Gas per 24 Hours.				Calorific Power per Cubic Metre at 15° C. & 760 mm.		Fuel Used for Heating the Settings.
	Total.	Per Setting.	Per Retort.	Per 100 Kilos.	Gross.	Net.	
	Cub.Met.	Cub.Met.	Cub.Met.	Cub.Met.	Cal.	Cal.	Per Cent.
July 25 . .	17,070	2439	631	33·6	5196	4798	14·00
,, 26 . .	15,150	2164	583	35·1	4977	4460	16·60
,, 27 . .	13,870	1981	534	30·6	4887	4343	16·06
,, 28 . .	13,330	1904	535	30·7	4927	4338	15·50
,, 29 . .	13,260	1894	530	31·0	5233	4661	15·00
Averages .	14,536	2076	562	32·2	5040	4520	15·43

Note.—Retorts under scurfing: July 25, one; 26 and 27, two; 28 and 29, three.

acknowledged that the result of the mixture of the two coals was not so good as that which was obtained when they were carbonized separately. This improvement may without doubt be attributed to the Saar coal. (See Table IV.)

French Coal Alone.

The small consumption of gas in the months of July and August allowed, after the lighting-up of a seventh furnace, of some trials being made with unscreened coal from Courrières and Liévin alone. The results are given in Table V. According to the tests carried out at Zurich, the average quantities of gas and ash from the coals were: Gas, 34·2 cubic metres; ash, 10·8 per cent. These results, which are less favourable than those shown by the preceding tables, arise from the nature of the coal carbonized, which contained less gas and more ash, and required a longer distillation period by about 20 per cent. than the German and English coals. At the same time, it must be pointed out that the French coals, whether from the North or from the Loire basin, do not pass down the retort very readily, and require more frequent pricking than the others. This inconvenience may arise from the swelling of the coal, from the fact that the clinker is of a very clinging nature, and in large measure from the physical nature of the coal.

Heating of the Furnaces.

In the preceding tables has been shown the amount of heating fuel required by the Woodall-Duckham settings. At the outset, scurfing was done every 24 hours; whereas now it is done every 48 hours only. There is a very appreciable difference in the fuel for heating with these two methods. In the period from the 19th of March to the 15th of April, scurfing every 24 hours, the average was 14 per cent.; from the last-named date to the 13th of May, scurfing every 48 hours, it was 12·53 per cent.

Coke.

The quality of the coke produced by retorts on the continuous principle has been very much discussed, especially by people who have had an opportunity of seeing these retorts in operation in London. They are, however, unanimous in recognizing that the Malley coke is better than that coming from the retorts at Kensal Green. This difference arises first of all from the improvements which have been made in the Lausanne settings, and also naturally from the quality of the coal. For example, the best coke was produced by the French coals. The mixture of French and German coals yielded a good coke; whereas that produced by the German coal alone was smaller and swelled more easily. From this point of view, the English coal must be classed with the German. Generally speaking, the coke now produced is preferred by customers to that which came from the horizontal retorts, particularly on account of its dryness. A series of analyses showed that its moisture was only 0·3 to 0·5 per cent., which, from a practical point of view, is a negligible quantity. With regard to size, the following are some of the results of screening coke from "Chana" (French) coal:

	First Test. Gross Weight.	First Test. Per Cent.	Second Test. Gross Weight.	Second Test. Per Cent.
Coke above 60 mm. . . .	371·7	42·8	250·7	71·8
,, from 40 to 60 mm. . .	243 0	27·8	61·5	17·7
,, ,, 15 to 40 mm. . .	101 2	11·5	16·6	4·8
Below 15 mm. (dust) . . .	156 8	17·9	20·1	5·7
Total	872·7	100·0	348·9	100·0

This coal was the kind which yielded most large lumps. Screening was done with a gauged fork. There was an Eitle machine at the old works, and with it 3000 kilos. of coke were screened, with the following results:

	Kilos.	Per Cent.
Coke above 80 mm.	71	2·4
Central coke, 50 to 80 mm.	1342	44·6
Broken ,, 30 to 50 mm.	803	26·8
Small ,, 15 to 30 mm.	554	18·6
Dust ,, 15 mm.	183	7·6
Loss	47	
	3000	100·0

Estimates of the production of coke can be made with accuracy at the end of the year, though fairly correct measurements have already been made by calculating the quantity of coal passing through a retort per hour, and collecting, during this period, all the coke coming from the retort. Methods of checking have also enabled the hourly carbonization of coal to be ascertained, and demonstrated that the errors which might occur were insignificant. The following are the results of three tests of the "Chana" coal already referred to:

	First Test.	Second Test.	Third Test.	Average.
Coal carbonized . kilos.	1856	1856	1793	—
Yield of coke . . ,,	1431	1272	1363	—
Do. per cent.	77·1	68·53	76·01	73·88
Weight of a cubic metre of coke . . . kilos.	402	402	372	392

A sample of coke from a mixture carbonized at the works gave, as its heating power, ash and water being deducted, 8039 calories.

Tar.

A sample of tar from the different coals, analyzed at the Zurich Laboratory, gave as its density, at 15° C., 1·09; and its heating power, deducting ash and water, 9240 calories. A return made in June gave the production of tar as 6·8 per cent. It is very fluid, and it has been tried by MM. Sulzer Frères, of Winterthur, as fuel in Diesel engines. Up to the present, the results of these tests have been very good, and give promise of a new market for tar.

COAL LIMING.

By "Alter Ego."

The interesting description of the coal-liming process at Cheltenham, published in the "Journal" for Oct. 10, will undoubtedly excite much comment throughout the gas profession. While the system, considered simply as a means of purifying the gas from sulphur compounds, can hardly be credited with the same efficiency as the use of lime in purifiers (which reduced the sulphur impurity to an average of about 12 grains in the clean gas), it does to all intents and purposes fulfil all practical requirements.

Make per Ton and Candle Power.

The majority of gas engineers will, however, be more interested in the improvement shown in the make of gas per ton as a direct result of adopting the liming process. It is here where the system, if its efficiency is endorsed at other works—and this must always be demonstrated before any system can be looked upon as certain in its effect—will pay for itself so handsomely. An extra yield of 845 cubic feet of gas per ton of coal represents a very large sum of money in a works of any magnitude. It is extraordinary, too, and at the same time highly satisfactory, that the candle power has actually increased by ¼-candle since the system was first adopted. While with heavy charges introduced in place of light charges an increased make of an equal quantity may be reasonably expected, it is, as far as the writer is aware, invariably found that the candle power is reduced by (say) ½ or ¾ candle, though the calorific power shows but slight reduction. This increase in candle power at Cheltenham seems to endorse in some degree the claim that the increased make per ton is entirely due to the liming of the coal.

Stopped Ascension Pipes.

Technical men will not be satisfied until a scientific explanation is given of this phenomenon. Presumably the addition of the lime

to the coal causes, by some unknown means, a marked reduction in, if not a cure for, stopped ascension pipes. This is the direct, and the make per ton the indirect, cause of the treatment. The writer can quite conceive that in works where stopped pipes have been very prevalent and are by some means suddenly cured, the effect would be an immediate increase of a substantial amount, and probably as large as that mentioned, in the make per ton. But how does the liming prevent the stopped pipes? It is generally conceded that they are caused by a crude and hurried distillation of the tar before reaching the hydraulic main, and also by deposition of carbon (from the gas) in the ascension pipe instead of the retort. The action of lime in this manner would seem quite unaccountable; but presumably there is an explanation. It is further stated that, owing to the freedom from stopped pipes, it was found possible to increase the heat of the retorts. Usually increased heats mean a higher make per ton (which was obtained), but of a lower quality. Instead of which gas of a higher candle power is produced as a result, it is claimed, of the liming process.

Carbon in Retorts.

In the descriptive article on the Cheltenham process, it is pointed out as a curious fact that considerably less carbon is made, and that no explanation can be given as to the reason. It would seem evident that if stopped pipes are prevented by some means or other, the pressures in the retorts will also be substantially reduced, with the direct result that less carbon will be deposited. It is well known that nothing is so productive of carbon in the retorts as pressure of the gas. It is undoubtedly caused by the inability of the gas to leave the retort quickly; and thus the hydrocarbons present are split up into hydrogen and carbon. This fact is sufficiently emphasized in small works where no exhauster is fixed, and where the pressure in the retort is, therefore, always very high.

Effect on the Coke.

As to the lime contained in the coke, it is stated that its presence causes no deterioration in the quality of the coke. This being so, it presumably fetches as high a price as coke from unlimed coal. It is, therefore, evident that at least 80 per cent. of the lime used is sold as coke; and by this means much of the cost of the material is recovered. The only actual loss in weight would be that contained in the coke used as fuel. But these points raise the question, Does the lime itself undergo a change during the process of carbonization, or does its presence react on certain constituents in the coal? It seems quite incredible that lime could be in any way affected by heat, as it must be remembered that in its formation it has already undergone a hard burning in the kilns. Thus it would appear that the presence of lime has some subtle effect on certain of the products or gases passing up the ascension pipes from the coal.

The writer some years ago was somewhat inconvenienced by a heap of lime stored away on a purifier floor which was at the best of times of decidedly restricted area. The use of lime for purification had been abandoned; and as little room was left for the storage of oxide, he conceived the idea of using up the lime by mixing it with the coal, as proposed many years before by Cooper. The object was primarily to dispose of the lime and incidentally the increasing of the yield of ammonia. No effect, however, was noticed in the quantity of this bye-product, although fears were entertained that the small pieces of lime visible in the coke would lead to serious complaints. The writer must confess that the mixing of the lime with the coal was done as imperfectly as in the Cheltenham process it is done perfectly.

The description of the "Diehl-Faber" process, showing chemically the effect on the coke of adding lime to coal, will be to most minds convincing proof that the coke under the liming process will be greatly improved in one important respect, and that in the matter of sulphur content. Gas coke contains too much sulphur for certain important purposes, and any process which will substantially reduce this undesirable impurity will be the means of opening up a new market for the fuel. On one occasion the writer attempted to make some coke in a retort of a quality suitable for a foundry; but, on being used, it was found to be good enough in every respect except in that of sulphur impurities.

The liming process promises well, and will almost certainly be adopted in other works. But meantime many will await with interest an explanation of the causes of the curious effects of the treatment.

Referring to the reported discovery of coal on the estate of Sir Harry Verney, Bart., at Calvert, in Buckinghamshire, within 50 miles of London, "Nature" says: "It appears that exploratory work has been carried on intermittently for several years at this locality, and that a boring, which was sunk six years ago in quest of water, encountered coal gas under pressure of about 60 lbs. per square inch at a depth of 470 feet. Two boreholes are now being sunk, and it is announced that one of them, after passing through an outburst of gas, reached coal at a depth of only 530 feet from the surface. Should this announcement be confirmed, it will justify the belief of those who hold that concealed coalfields may exist at workable depths between the Midland fields and those of Bristol and Somerset. So far back as 1877, a famous boring at Burford, in Oxfordshire, struck the coal measures at a depth of 1184 feet, beneath a cover of Jurassic and Triassic rocks. At Batsford, in Gloucestershire, the coal measures have likewise been found beneath secondary strata."

ELECTROLYSIS OF GAS AND WATER MAINS.

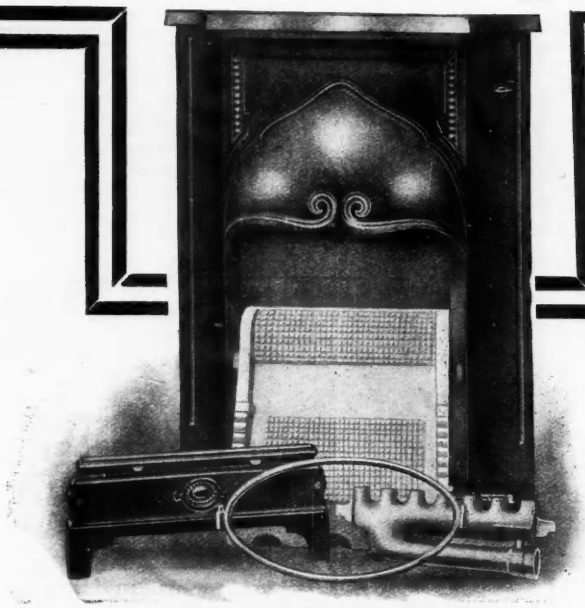
The report of the Committee appointed by the German Association of Gas and Water Engineers to investigate the question of the electrolysis of gas and water mains, states that the prescriptions made last year by the Association jointly with the Association of German Electricians and the Association of German Tramway and Light Railway undertakings have excited general interest both at home and abroad. A summary of these prescriptions was given in the "Journal" last year [Vol. CXI., p. 34]. The prescriptions were made as brief as possible, and did not go into details; and it was contemplated to issue later explanations of points on which questions had arisen. A note giving explanations has since been published.

The Committee of the German Association were unable to carry on independent investigations so long as their work was merged in that of the Joint Committee of the three technical bodies mentioned; but the dissolution of the Joint Committee after the issue of the prescriptions already referred to allowed the Association's Committee to resume their independent work. But it was unnecessary for them, in view of the investigations which had been made by the Joint Committee, to carry out further general researches. They have therefore confined their activities to dealing with special cases which have been brought to their notice during the past year. Having regard, however, to the fact that the investigations in these special cases were not of general interest, but would be carried out only for the benefit of the undertakings directly concerned, it was decided to ask the latter to bear the cost. Herr Besig, who has for several years made investigations for the Committee of the Association and for the Joint Committee of the three Associations, and who is now established as a civil engineer in Frankfort-on-the-Maine, has been retained by the Committee to undertake the work required.

In June, 1910, investigations were renewed at Dantzig. As a result of investigations made by the Committee in 1906, the Dantzig tramway undertaking had carried out extensive improvements in their installation, mainly in accordance with suggestions of the Committee. The present investigations were made with a view to ascertaining whether the measures adopted had sufficed to prevent currents entering the gas and water mains. The results showed that the risk to the mains through return currents of the tramway had been very greatly reduced, and that no serious apprehension need be entertained in future if the existing conditions are preserved. One of the measures adopted in Dantzig was the use of suction dynamos on the long return conductors. It has been found that this method of equalizing the potential at points in the return conductors, and thereby reducing the tension in the system of rails, must be used with caution, as the saving in copper for the return conductor is balanced to a considerable extent by the increased losses in the dynamos, which must be made larger in order to meet the fluctuations in working. The efficiency of the dynamos in ordinary working is therefore affected unfavourably. The method appears, however, to have considerable value for return conductors at a considerable distance from the central station, and no difficulty has been experienced in the working of these dynamos.

The Committee have also made further investigations at Freiburg, where the distributing mains were examined by them some years ago, but where considerable extensions of the tramway systems have since been made. The work done recently has so far been only of a preliminary character—preparatory to the taking into use of the extensions of the tramway system; and a provisional report only has been issued upon the tests made. The advice of the Committee has been sought in regard to protecting pipes from electrolysis in connection with a project for an electric tramway from Bâle to Lörrach.

An interesting case has been investigated at Hagen-Eckesey, where the mains of the German Continental Gas Company had suffered severely in the neighbourhood of the electric tramway lines. The investigations did not lead to any definite conclusion as to the cause of the destruction, because the conditions became completely altered through the mains being relaid. It was, however, established that the soil in which the pipes were embedded had played a considerable part in their destruction. Ashes, clinker, &c., had been used to cover the pipes; and the conductivity of this material was such that, even with relatively small tensions in the rails, earth currents when concentrated in places where the conductivity was so good had a very powerful action. Quite apart from this, however, the corrosive chemical substances remaining in the ashes and clinker must have acted destructively. The Committee remark that this experience again confirms the views previously expressed as to the unfavourable action of bad soil round the pipes. Some investigations were carried out at the town of Waldenburg; but no report was made as to the results. In May last, extensive investigations were undertaken at Geneva, where there had been many cases of destruction of mains. The results are not yet available; but they should have considerable general interest. Examinations are being made of mains in Strasbourg, where similar measures were adopted some years ago to those followed in Dantzig. The present examination is being made with a view to ascertaining whether these measures have been adequate. In July last an investigation of the vagrant currents at Aix-la-Chapelle was being undertaken by the Committee. Other towns which have applied to the Committee for help include Salzburg, Spandau, and Rathenow.



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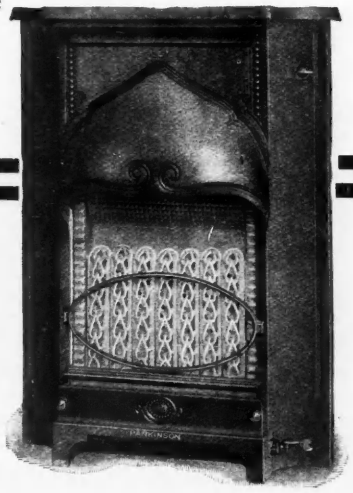

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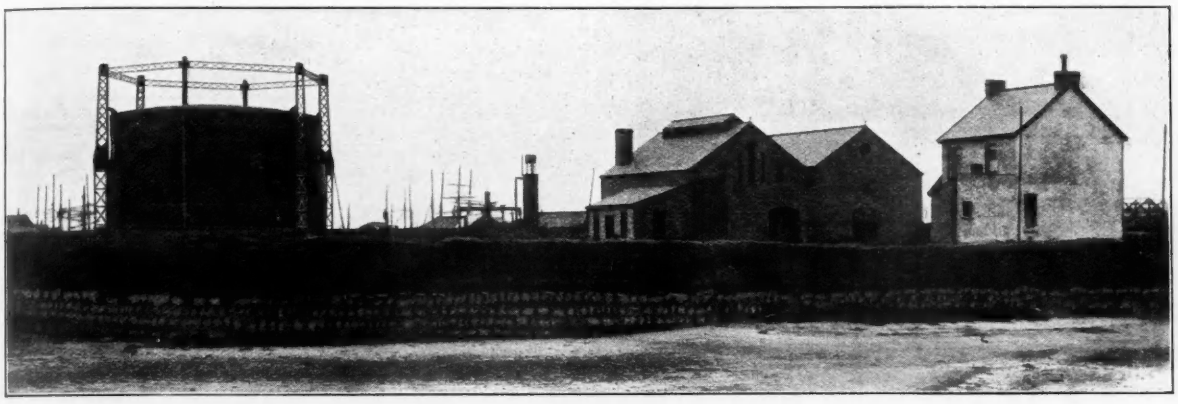
ST. BLAZEY NEW GAS-WORKS.

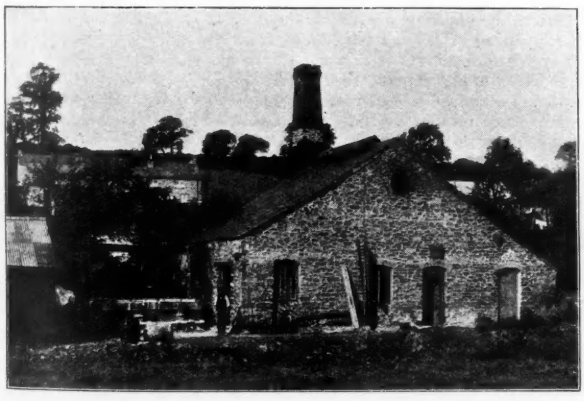
In the "Journal" for the 3rd inst. (p. 55), there was given a short account of the opening of the new works erected at Par Harbour for the St. Blazey Gas Company, Limited. Since then we have received fuller particulars of the installation, together with photographs showing the old and new works, from Mr. H. E. Riley (Engineer and Manager to the St. Austell Gas Company, Limited), who is Consulting Engineer to the St. Blazey Company.

The plant at the old works had been working to its utmost capacity for some years; and when, in 1910, the Great Western Railway Company made application for a supply of gas for their locomotive and carriage shops at St. Blazey, the Directors of the Gas Company knew that they were not in a position to entertain it unless steps were taken at once to put in new plant. Accordingly, Mr. Riley was consulted; and it was decided to practically rebuild the works. Difficulties occurred in obtaining any land adjacent to the old works; but a convenient site at Par Docks was secured. The question of obtaining capital had then to be considered. The Engineer was of opinion that new works could be



The New Works of the St. Blazey Gas Company at Par Dock.

erected with an additional capital of £3800; and this sum was speedily subscribed by residents in the neighbourhood. Plans were at once prepared by Mr. Riley for the erection of a works on the new site. Competitive tenders were invited; and the contract was eventually placed with Messrs. Willey and Co., of Exeter, for the engineering plant, and with Mr. J. Alderman, of Par, for the buildings. The contracts for the work were let at the end of March, and have been carried out very satisfactorily. The retort-house and coal-store were finished in nine weeks from the signing of the contract—two weeks less than contract time. The works would have been ready for opening earlier than they were, but for the fact that the long drought prevented the authorities giving the supply of water necessary to fill the holder tank.



The Old Works of the St. Blazey Gas Company—Erected in 1862 by Messrs. George Bower and Co.

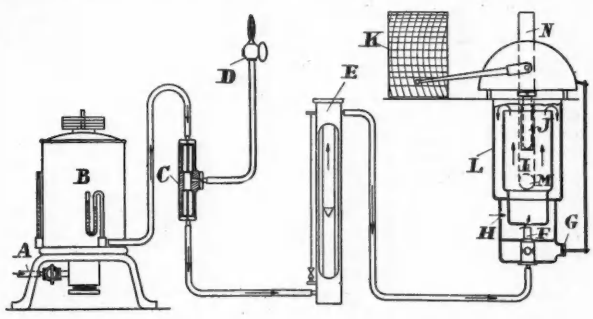
The retort-house and coal-store are twin buildings, built with Par bricks; and each is 42 feet by 30 feet and 16 feet at the eaves. In the retort-house are two settings of retorts on the generator principle. One setting consists of one 21 inch by 15 inch oval and two 18-inch round retorts; and the other consists of three 21 inch by 15 inch oval and two 16 inch round retorts. The arches containing the setting are well braced with 12 inch by 6 inch and 8 inch by 5 inch steel joists, and the tie-rods and hydraulic mains are carried on steel joists clear of all brickwork. The hydraulic main and other fittings are all of the latest and best types. The coal-store will hold 400 tons of coal; and the proximity to Par Docks will result in a saving of 8d. per ton carriage compared with the old works—more than sufficient to pay the ground rent of the new site. Though the freehold of the works could not be obtained, a lease of 250 years has been secured.

The condensers, of the vertical type, are at the end of the retort-house; and adjacent to the house is a building containing the engine, exhauster, meter, and governor. The whole of the plant is under one roof, with a door leading from the retort-house, thus giving better control, which, in a small works, is important. Outside is a steel tower scrubber, with wood grids and water-spreading arrangement. The purifiers are twin boxes, 6 feet square, on the luteless principle, with patent rubber joints. The valves are of the "Pickering" patent type; and provision is made for the removal and re-erection of two purifiers from the old works. The gasholder is 40 feet in diameter and 16 feet deep. It has a capacity of 20,000 cubic feet, and is erected in a steel tank built on a concrete base; the ground being of such a sandy nature that it was not suitable for a masonry tank. Ample room is available for extension. For the present, one holder only is erected; and the holder at the old works will give additional storage.

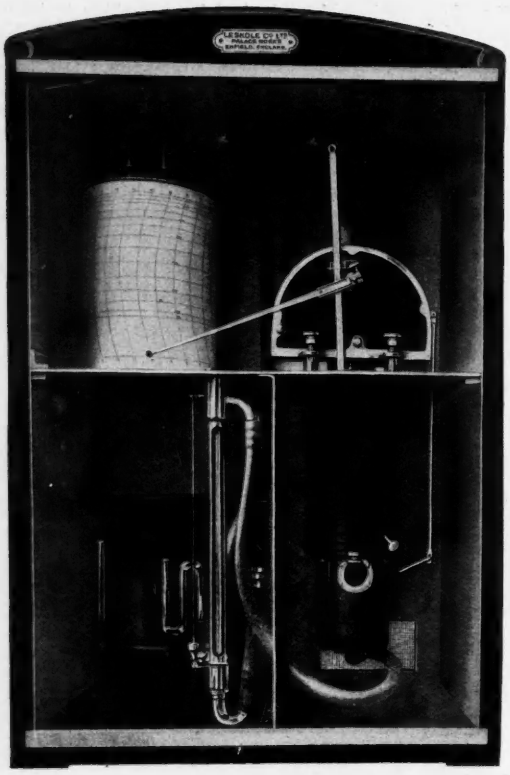
About 4000 yards of mains, consisting of 6, 4, and 3 inch Mannesmann steel tubes, have been laid throughout the new district; and the applications coming in for gas to be laid on augur well for the future welfare of the Company. The Great Western Railway Company have spent some £700 in fittings, and will require about a million cubic feet of gas per annum. The docks are to be lit by gas, as well as the two Par lighting areas; so that there is a good nucleus of business for the new works. A convenient dwelling-house and office have been erected for the man in charge of the works; and the office will be used for board meetings, and also as a show-room. The works are bounded on two sides by the sea, and on the other sides by walls. Though comparatively small, the works are up-to-date in every particular.

THE LESKOLE RECORDING GAS-CALORIMETER.

It will no doubt be of interest to many "Journal" readers to learn that the latest development in the field of calorimetry is the adaptation for the English market, by the Leskole Company, Limited, of Palace Works, Enfield, of Dr. Fahrenheim's recording calorimeter. The inventor is Chief Engineer of one of the most up-to-date gas-works on the Continent, and has for many years been looked upon as an expert in calorimetry. He brought out an early form of his calorimeter some five years ago, and a goodly



number of them are still in daily operation. The present instrument, which is shown below, embodies many improvements suggested by practical experience, and, it may, we think, justly be considered the last word in the construction of instruments of this kind. The most noteworthy advance on anything at present available is found in the fact that there are no liquids of any kind, and that the calorimeter reproduces the conditions under which gas is burnt in practice more closely than probably any similar



instrument. Other advantages, which will be apparent from the description below, are compactness, simplicity of action, automatic air regulation, and immunity from interference through atmospheric changes. The apparatus is supplied on a definite guarantee of accuracy within 1 per cent.

The action of the calorimeter is shown by the diagram. The gas enters at A, and first passes the governor B, which serves to balance fluctuations in pressure. Leaving the calorimeter by the pipe shown, the gas is next passed through a system of capillaries C. This, in conjunction with the auxiliary burner D, regulates the flow of gas, so that variations in specific gravity do not influence the volume furnished to the burner in a unit of time. The gas enters a specially designed meter E, by means of which the calorimeter is adjusted to the correct flow, and thence the burner F is reached. The air for combustion is supplied through the valve G, which adjusts itself automatically in accordance with the temperature of the exit gases, so that perfect combustion is always maintained. A secondary stream of air enters at H, mixes with the waste gases, and passes upward through the casing. This contains the pyrometer J, which, when heated by the gases, expands—thus operating the pen gear. The degree of expansion is a direct measure of the heat value of the gas, which is shown directly in B.Th.U on the 24-hour chart K. After passing the pyrometer, the gases turn downwards through the outer jacket L, and out at M through the chimney N. In this way the pyrometer casing is kept at a high and constant temperature, so that it cannot be affected by atmospheric changes.

A Good Advertisement for Gas.

The "Glasgow Herald" last Friday contained a page advertisement, headed "Coal Gas and its Uses," to which attention may be directed as a particularly good example of what may be done to bring under public notice the various purposes for which gas may be employed, and the appliances available for its most effective utilization. The centre of the page is occupied by four columns of reading matter, dealing respectively with the use of gas in the home and in industry, its hygienic value, and its importance as a factor in the solution of the smoke problem. The articles are written in an attractive style, and moreover are not too long or too closely printed to repel the busy reader. Enclosing the text on either side are a number of advertisements of some of the principal makers of stoves, burners, &c.; while at the foot is one by the Glasgow Corporation Gas Department, announcing that the latest cookers, gas-fires, and water-heating appliances may be seen in actual operation at their show-rooms, where cooking and laundry demonstrations are given at intervals. As a final word, the advertisement assures the reader that "gas is clean, healthy, and economical." It only remains for him to put this statement to the proof to become convinced of its accuracy. Whatever effect the advertisement may have upon the citizens of Glasgow, the member of the staff of the Corporation Gas Department responsible for its compilation deserves to be complimented upon the result of his efforts in assuredly the right direction.

MR. HOLMES HUNT'S INSTITUTION PAPER.

A Reply to the Glasgow Discussion.

It will be remembered that Mr. P. C. Holmes Hunt, of Melbourne, was unfortunately unable to be present when his paper on "Carbonizing Systems—A Review and a Selection" was presented to the Glasgow meeting of the Institution of Gas Engineers; so he could not at the time reply to the different points raised in the discussion. He has, however, since had an opportunity of doing so in writing; and his remarks reached London by last week's mail. The following copy of them has been sent to us by Mr. Walter T. Dunn, the Secretary of the Institution.

First allow me to express my appreciation of the manner in which my paper was received by the meeting. The contribution appears to have elicited a fair amount of criticism and provided points for discussion. I regret to find, however, that in one or two cases the criticism was made without regard to actual facts; and I am consequently much indebted to the President for giving me the opportunity to reply.

In opening the discussion, Mr. Allen made a strong case for horizontals, as exemplified by his own splendid arrangements and results at Liverpool. I would, however, point out that, in considering the labour required in the particular retort-house he refers to, if the foreman and greaser were eliminated (in order to compare with the table shown in my paper), the total number of men required in the retort-house would be 36—equivalent to a duty of about 7 tons of coal per man per 24 hours. As compared with this, my inquiries showed that with a plant to carbonize 250 tons of coal per day on the Dessau system—embodying the latest setting of eighteen retorts—a duty of about 23 tons per man should be realized. Mr. Allen asks for particulars of capital cost. I found that the Dessau system would cost in England about £140 per ton, including retort-bench (complete with coke-conveyor), retort-house, coal crusher and elevators in duplicate—in fact, everything; exclusive only of the foundations and the coke-conveyor outside the retort-house. The Woodall-Duckham plant would cost rather less than this figure, and the Glover-West more. I do not gather that Mr. Allen included the retort-house or stage floors in the capital cost for a horizontal installation quoted by him—namely, £89 per ton; whereas in my estimate of £100 per ton, these two items were included.

There appears to have been a little misunderstanding in Mr. Belton's mind in regard to my reference to coke, and the diminution of the smoke nuisance. I certainly did not intend to convey the impression that I regard these two items as the chief consideration of the gas manufacturer; but I endeavoured to point out that smokeless carbonization is a desirable thing to attain, provided the system were advantageous in other respects. As to the question of coke, I am bound to say that this appeals to me as being undoubtedly an important local argument to which consideration must be given in the selection of a carbonizing system.

Mr. Thomas Glover's regret that British engineers were not ready to convince me that a British system is the best, is only equalled by my own; and I am sure I hope that Mr. Glover's prophecy—that the British system will prove itself, in the course of a few years, all-round superior to one having its origin abroad—will be realized.

To my mind, Mr. Broadhead is probably correct when he says that many local factors must operate in the selection of the intermittent system in preference to the continuous; and it is, indeed, the "local conditions" argument which must in these days mainly prevail in the selection of a carbonizing plant. As regards the question of smokeless carbonization, my observations left me with the opinion that Mr. Broadhead has arrived at—namely, that the intermittent system would, in due course, be improved to the extent of reducing the smoke nuisance to a minimum.

I would especially thank Mr. Bell for his complimentary remarks. Mr. Bell has done such splendid work in improving the status of the horizontal retort that his acknowledgment that verticals will give better results than horizontals cannot but be regarded as a very valuable concession to the former system.

I am sorry Mr. Samuel Glover did not make more detailed remarks by way of criticism—especially after his reference to sportsmanlike conduct, and the President's assurance that I should be given an opportunity to reply. Mr. Glover's statement that I should find my conclusion about the Dessau system of carbonizing coal in vertical retorts on the intermittent system contradicted by results obtained from both the continuous and intermittent systems is (to date at any rate) not proved. A close perusal of the papers submitted to the meeting, and the discussion thereon, fails to disclose anything that can lead me to change my present opinion on the matter, but rather further justifies my selection.

Mr. John West takes exception to my statement that the Woodall-Duckham system is the only one aiming at continuous working. In proper fairness, this statement should have been noted in conjunction with the context, when Mr. West would have noticed that "I had pictured the system as a distinctly continuous process, not only in the evolution of gas but in the supply of coal to the retort and the discharge of coke." In the Glover-West system, the coal is fed into the retort under pressure from a small hopper fixed at its upper end. This hopper is periodically filled with coal from an overhead bunker, by opening a valve on top.

In the Woodall-Duckham plant, the coal is fed into the retort practically continuously by means of a revolving feeding device—receiving its charge of coal from the bunker overhead; and as long as the latter is properly supplied with coal in the usual way, the feeding device is constantly supplying the retort. The Glover-West feeding arrangement is, to my mind, an improvement on the Woodall-Duckham system; but nevertheless the aim of the latter is to feed the retort continuously, and with the minimum of attention. The discharge of the coke from the coke-collecting chamber is effected in the Glover-West system by opening a lid every few hours. But this discharge in the Woodall-Duckham plant is carried out in an automatic fashion, and does not require any labour for the operation of allowing the coke that has passed the coke extractor to discharge from the chamber.

Mr. West also appears to object considerably to my remark that the possibility of both systems had to be judged mainly on "opinion, theory, and surmise." Now what was the actual position of continuous carbonization, as exemplified by working plants, when I was in Europe last year? The only example of the Glover-West plant in operation, when I arrived home, was the experimental setting at St. Helens. The Droylsden installation was in course of construction, and was only put into action three months prior to the time that I had to definitely make up my mind what system to adopt. The Woodall-Duckham system had undergone considerable development, and, in its latest example, an entirely new system of construction was being incorporated, together with a new idea for the discharge of coke. Of course, I had read of all the various tests conducted at St. Helens, extending over a limited period; but nevertheless I maintain that I had to be guided by opinion as to how the plant would act under certain conditions, by theory as to what general results might be obtained, and by surmise as to wear and tear and other important factors. Mr. West's remarks referring to the test I made at Droylsden (through the courtesy of the Chairman and Gas Committee of the Manchester Corporation, and Mr. Newbigging) are not similarly reported in the two technical journals. In one he is reported to have said that I suggested the test should be made with 200 tons of coal, while the other report states that Mr. West asked for 200 tons for the test. I must give Mr. West the benefit of the doubt, and believe that the latter version—being in accordance with fact—is the correct record of his remarks. But he might have added that he required only 50 tons for information as to the behaviour of the coal in the retort and the class of coke produced. I have noted very carefully what Messrs. West and Newbigging said regarding the test at Droylsden; but I can assure them that the Glover-West plant was afforded quite as good an opportunity as the other systems for demonstrating its carbonizing capabilities with the Australian coal. So far as the intermittent system is concerned, I may say that the test at Dessau lasted for 22 hours—200 to 300 tons of coal being asked for, and only 50 tons being available—while the test at Droylsden lasted for 21 hrs. 40 min.—37 tons of coal being available.

There is surely evidence enough in these figures to show that I was quite justified in stating that, "as the quantity of coal for each test was very limited, it will be recognized that a trial extending over a comparatively few hours cannot well do justice to any plant; and it is not considered desirable, therefore, to publish the results. Neither would it be fair to draw a definite conclusion as to the comparative sperm values obtainable from the various plants."

In referring to labour charges, Messrs. Glover, West, and Newbigging appear to have spoken without regard to fact, and so have all fallen into the same error; and I am persuaded that if these gentlemen had done me the honour to at all closely follow the arguments in my paper, or had acquainted themselves with the development of the Dessau system, as reported in technical journals from time to time, they would not have allowed themselves to say what they did. Since they ignored what I wrote, it must be concluded that they were entirely without knowledge of the new type of setting on the Dessau system which comprises eighteen retorts, each three of which are coupled together and operated as one. The criticism of these gentlemen on the labour question can hardly, therefore, be taken seriously; but, nevertheless, I feel compelled to repeat that my argument in regard to labour charges was based on the working of the latest type of Dessau setting.

The fact is that no one with up-to-date knowledge of the system could possibly quote Sunderland as an example of the low labour charges of which it is capable. Horizontals and machinery can obtain just as good results; and in Melbourne, with De Brouwer machines, our results compare very favourably with those obtained from the Sunderland verticals. My investigations showed that the Sunderland installation could no more be regarded as the last word of the Dessau system than the St. Helens installation could be of the Glover-West process. Moreover, I venture to say that if the Sunderland setting was of the latest type, the present staff of men would be able to attend to more than six beds.

However, I may state that the figures compiled under this heading, and shown in the table in my paper, were arrived at by taking into consideration the number of men per 24 hours which the various firms considered would be necessary to work a plant to carbonize 250 tons of coal per day—checked, as far as possible, by my own personal observation of the work being performed in different places. I may say also that the Dessau system asked for fewer men than either of the other two vertical systems; and I was able, through observation of the work being performed on the Continent, to satisfy myself that these figures were an over, rather than an under, estimate. And if one point stood out above others as a result of my investigation, it was the undoubted fact that at the then stage of development the intermittent system of carbonization in vertical retorts promised to be rather cheaper for cost of manufacture than continuous carbonization, at any rate on a large scale. Moreover, I believe that up to the present it must on no account be considered a foregone conclusion, as Messrs. Glover and West appear to think, that continuous carbonization necessarily means the lowest labour charges. I would suggest that, before committing themselves further on the point, it might be advantageous for them to find out what the "other fellow" is doing.

I am much interested to know that Mr. West is about to carry out a test of our Australian coal in the Glover-West system; and it will be very interesting to compare his results with those obtained from our own installation of Dessau verticals now in course of construction.

I note Mr. Newbigging's objection to my remark that the continuous system was still in its experimental stage; but I also note that Mr. Newbigging, in his reply to the criticism on his own paper, stated that the working results over the period during which the installation of Glover-West retorts had been at work, were largely of an experimental character. Mr. Newbigging states that there is no justification to assume that a higher sperm value can be obtained with the intermittent than with the continuous system of verticals. This view is, of course, opposite to mine; but I am certainly open to conviction on the matter, if it can be clearly proved. It would appear, however, that the only satisfactory way to settle the point would be to carry out the tests as suggested in my paper. In speaking of coke, Mr. Newbigging, of course, has chiefly in mind his own local conditions, and the class of coke produced from the varieties of coal available in his particular district. Naturally, I have viewed this matter from the point of view of my local conditions; and there is no doubt whatever that the coke from the coal we carbonize is improved in the Dessau vertical retort, and is more suitable for our local market than that produced from the Glover-West process. Mr. Newbigging's remark that he certainly looked for more justification for my selection than was found in my paper, suggests that, apart from the question of labour, there were other points on which he did not do me the honour to follow closely my arguments. I must, therefore, inform him that the following were the points which weighed with me when choosing the Dessau in preference to the Glover-West system: (1) The Glover-West system was really not out of its experimental stage. (2) With the Dessau system a coke more suitable for the Melbourne market can be produced. (3) Proved increase in yield of tar and ammonia from the Dessau system over a long period compared with horizontals. (4) Also proved reduction in naphthalene and sulphur compounds over a long period. (5) Indication that a higher sperm value may be obtained from the same coal. (6) Complete absence of moving machinery. (7) Probably cheaper cost for labour. (8) Considerable saving in capital outlay.

This surely is a formidable set of arguments in favour of my final selection; but whether in actual practice they are proved or disproved, I shall be happy later on to compare notes with Mr. Newbigging regarding the working of the Melbourne installation of Dessau verticals in comparison with a large plant on the Glover-West system, the erection of which will presumably be carried out at Manchester at no far-distant date.

DETERMINING THE QUANTITY OF NAPHTHALENE IN CRUDE COAL GAS.

A description of a method worked out by Herr A. Albrecht and Dr. F. Müller, of Fürstenwalde, for determining naphthalene in crude coal gas, was given in the "JOURNAL" Sept. 25, p. 809. Herr Arpad Wein, Chief Chemist of the Municipal Gas-Works at Budapest, has contributed to a recent number of the "Journal für Gasbeleuchtung," a paper in which he describes a method for the determination of naphthalene in crude coal gas, which aims at avoiding the loss of naphthalene which occurs in the method of Albrecht and Müller owing to the tar which separates in the washing vessels used by those authors. Herr Wein points out that the quantity of naphthalene in this tar may be quite considerable, and that, consequently, the naphthalene in the crude coal gas is, by the method of Albrecht and Müller, underestimated to a corresponding extent.

The method adopted by Herr Wein is a modification of the picric acid method, in which the naphthalene picrate is decomposed, by boiling, into naphthalene and picric acid. Naphthalene picrate contaminated with tar and ammonia, if distilled into clean solution of picric acid, can thus be determined without the loss of the naphthalene dissolved in the tar. The apparatus used by the author is shown in fig. 1. He takes 700 c.c. of solution of picric acid containing 12 grammes in 1 litre, and evaporates it to about 600 c.c. This solution is then divided equally between the three wash bottles A, B, C, and the gas is sucked through them by means of a water-jet pump. It is measured in the meter shown in the figure, which is protected from injury from the impurities in the gas, by the purifiers D and E which contain oxide, cotton wool, and sulphuric acid. The reduction of pressure is ascertained by a pressure-gauge, and the volume of gas corrected accordingly. With crude coal gas 40 to 50 litres are sufficient for a determination; but not more than

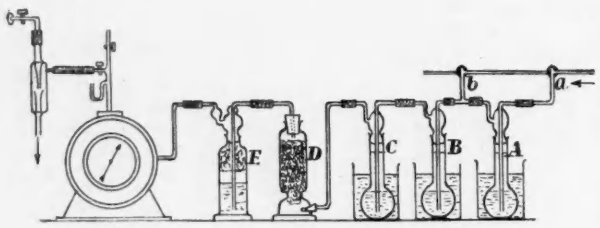


Fig. 1.

20 to 25 litres should be passed through the first bottle A, because excess of ammonia will decompose the naphthalene picrate already formed. In order to avoid this, the connection with taps *a* and *b* is used, by which the gas can, after 20 to 25 litres have passed through the first bottle, be passed directly into the second bottle B. The bottles are both kept cool by being placed in water, as shown. After a sufficient quantity of gas has passed through the apparatus, air is drawn through it in order to carry the naphthalene deposited in the connections into the solution of picric acid. The wash bottles are closed, and then kept for half-an-hour in a water bath heated to 40° C. After cooling, the whole of the precipitate is transferred to a filter paper, and washed with cold solution of picric acid. The filter, with the precipitate, is then transferred to an Erlenmeyer beaker containing about 500 c.c. of water acidified with sulphuric acid, which combines with any ammonia contained in the precipitate. The naphthalene is then liberated by slow boiling, and carried over (by means of a steady current of air) into a standard solution of picric acid. The apparatus used for this

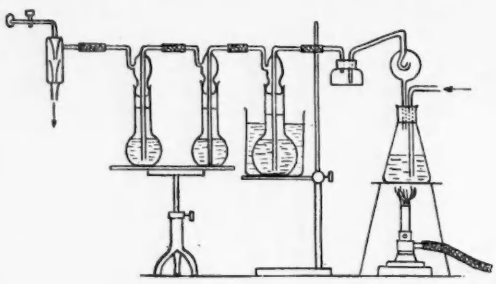


Fig. 2.

purpose is shown in fig. 2. After boiling for one hour, and afterwards drawing air through for half-an-hour, the whole of the naphthalene will have been transferred to the standard picric acid. The first wash bottle is a 500 c.c. measuring flask, containing 400 c.c. of a solution of picric acid, which becomes concentrated to about 350 c.c.; while the second is a 250 c.c. flask, containing 200 c.c. of solution, which becomes concentrated to 150 c.c. A third washing bottle containing 200 c.c. of solution is used as a guard vessel; but naphthalene rarely reaches it.

The titration of the solution of picric acid is carried out according to Schlumberger's iodometric method. Exactly 50 c.c. of solution of picric acid is mixed with from 10 to 12 c.c. of solution of iodide and iodate of potassium, containing 100 grammes of potassium iodide and 30 grammes of potassium iodate in a litre. The iodine which separates is titrated by means of one-twentieth normal solution of sodium thiosulphate. The picric acid acts as free acid, and liberates the equivalent quantity of iodine—

$$KIO_3 + 5KI + 6C_6H_2(NO_2)_3OH = 6C_6H_2(NO_2)_3\,OK + 3H_2O + 6I.$$

The solution of picric acid is handled in the analysis so as to avoid any loss of picric acid—that is to say, it is made and kept in the same measuring flask, and after the absorption of naphthalene is made up to the mark. The measuring flask is then closed and heated, with frequent agitation, to 40° C. in the water bath until crystals of picric acid, which may have separated by the evaporation of water which occurs, have been completely dissolved again. After the liquid has cooled, the naphthalene picrate is filtered off, and the unused picric acid in the filtrate is then determined iodometrically as already described. One c.c. of one-twentieth normal sodium thiosulphate corresponds to 0·0064 gramme of naphthalene.

The accuracy of the method was investigated by passing naphthalene vapour into picric acid. The naphthalene picrate, after filtering off, was distilled, in the manner described, into picric acid and determined. The results showed very close agreement between the amount of naphthalene taken and the amount of naphthalene found after distillation. Determinations of naphthalene in crude coal gas to this process gave the following results:

Temperature of the gas in the main, degrees Fahr. . . .	109·4	113·0	122·0	125·6	134 6
Grains of naphthalene per 100 cubic feet of gas. . .	79·4	88·4	162	169	293

The method may be applied to the determination of naphthalene in gas directly from the retorts, provided it is sufficiently cooled. If much thin tar collects in the washing bottles and renders the filtration of the solution difficult, all the liquid must be distilled.

MIDLAND JUNIOR GAS ASSOCIATION.

The Opening Meeting of the Seventh Session of the Association was held at the City of Birmingham Technical School on Saturday—the chair being taken at the commencement of the proceedings by Mr. R. S. Ramsden, of Burton-upon-Trent, the Retiring President.

A Welcome.

Mr. Ramsden, before the business of the meeting was taken in hand, said he felt sure he would be acceding to the wish of the members if, on behalf of the Association, he extended a very hearty welcome to Mr. R. S. Hilton, Mr. S. R. Barrett, and Dr. W. B. Davidson, who were honouring them with their presence. It was very gratifying to see these gentlemen coming among them to encourage them; and they all greatly appreciated it.

New Honorary Member.

Mr. Ramsden, proceeding, remarked that he had further pleasure in announcing that the Council had unanimously promoted Mr. James Hewett to the position of an honorary member of the Association. Mr. Hewett had been the backbone of the Association in its earlier years. He worked hard for it; and it was only fitting they should recognize his services in this way.

Introduction of the President.

Mr. Ramsden then said that, after what had been to him a most enjoyable year of office as their President, it was a very real pleasure now to give way to Mr. R. J. Rogers, because he was sure, from the enthusiasm and the unflagging interest he always gave to the work of the Association, that it was bound to flourish while he was in command of it; and if the Secretary, the Treasurer, and the other members of the Council gave to Mr. Rogers the same hearty support as they had accorded to his (Mr. Ramsden's) predecessors and himself, that gentleman would, he thought, find his duties as President to be of a most congenial nature. He would now ask Mr. Rogers to preside; and, in the name of the Association, he wished him a successful year of office and a happy and prosperous life, in both his professional and private capacity.

Mr. R. J. Rogers (Birmingham), who was received with applause, then took the chair, and remarked that his first pleasant duty was to propose a hearty vote of thanks to Mr. Ramsden, who had presided over the affairs of the Association in a very capable manner. They had all had many opportunities of gauging his worth. The way in which he had handled the reins of office had not only been creditable to himself, but had done much for the success of the Association during the past year.

Mr. W. S. Smart (Saltley), the Senior Vice-President, seconded the proposition, and said he thought everyone would agree that the last year had been a most successful one. The visit to Burton, and the other visits, were thoroughly enjoyed; and Mr. Ramsden had done much work in connection with the joint meeting of Junior Associations.

The vote having been heartily accorded,

Mr. Ramsden said he was much obliged for the vote and for all the kind words that had been said about his small efforts during the past twelve months. He would like to express his sincere thanks to all his colleagues on the Council, and to the members generally, for their kind help and support during his year of office—especially for the vast amount of work which was put in, principally by the Birmingham men, in making the joint conference of Junior Associations last May so successful.

Presidential Address.

Mr. Rogers next proceeded to deliver his Inaugural Address, which will be found on pp. 181-5; and at its conclusion,

Mr. W. H. Johns (Saltley) remarked that, as a member of the works staff, it afforded him the greatest pleasure to propose a hearty vote of thanks to the President for his able and comprehensive address. It was a sign of the times that the commercial and distribution departments should be more recognized than they had been in the past. They noticed that the distribution department was now opening itself out to deal with the problems that used to be left, generally speaking, to the gas manager. By this, he meant that the distribution department was formerly more or less neglected; but owing to the competition which now existed, it had become necessary that they should not wait for business to come to them, but should go out and look for it. One thing Mr. Rogers had mentioned which he (Mr. Johns) would just like to say a few words upon. He referred to the methods recently adopted by gas undertakings to push the hire and sale of appliances for heating and like purposes. The general gas-fitter was now, of course, grumbling about gas suppliers taking the bread out of his mouth; but it seemed to him that if the general fitter was left to himself he would not have very much bread to put there. These gas-fitters complained that the gas undertakings were trying to take their living away from them by going on to the ground which the fitters regarded as their own; but he thought that the fault was on the side of the fitters, who had negiected to go and look for this business, which gas undertakings themselves had now to seek, if they wished to prevent it from going to their competitors.

Mr. Smart seconded, and remarked that the address was teeming with points upon which Mr. Rogers had most definite opinions. Perhaps some of them would not quite agree with everything

he had said; but they would read the address with great interest when it was published in the "JOURNAL OF GAS LIGHTING."

IMPORTANCE OF THE COMMERCIAL SIDE.

Mr. R. S. HILTON (Secretary of the Birmingham Corporation Gas Department), in supporting the vote, said he would like to congratulate the members of the Association upon the departure they had made this year in taking as their President a man who was not actually engaged in the manufacture of gas. He thought that this was a sound move from their point of view; and it showed that the members of the Association had broad enough minds to see that, not only was the manufacture of gas important, but that it was essential that, having once manufactured the gas, they should be able to sell it. The sale of their gas appeared to him to be one of the greatest problems in connection with the gas industry at the present time. They knew that there were many capable engineers who could make the gas, and who could make it at a very low cost; but all this (excellent as it was in its way) was of no use unless the gas could be disposed of. And this was where he thought men like their President would help the Association to perhaps a broader view of the gas industry than they would have if they confined themselves entirely to works practice. It was an excellent address; and he did not quite agree with Mr. Smart that there were some things in it which needed criticism. But everyone had his own opinion; and it was one of the advantages of such an Association as this, that they had the various opinions of all the members voiced publicly. The net result was, of course, to the general good. He was particularly struck by the references in the address to the publicity movement which had just taken the form of the British Commercial Gas Association; and he thought it quite probable that this Association would be able to bring about some of the suggestions which Mr. Rogers had thrown out. First of all, in connection with the fitters—he spoke of the fitters not actually employed by the gas undertakings themselves, but fitters of the town—something might be brought about in the way of an examination for those men, to make them properly qualified and therefore authorized by the gas undertakings. He thought this was one point where the British Commercial Gas Association could help very much indeed the different gas undertakings; and as he believed it was intended that the groups of areas of the Commercial Gas Association should be practically the same as those of the various District Associations, it would be quite an easy matter, for instance, for them in the Midland district to arrange with the different gas undertakings that such an examination should be held, if they could get the necessary co-operation. There was one little statement in the address which he would like to correct, because he felt in a way that he was somewhat responsible for it. Mr. Rogers mentioned that gas for power purposes in Birmingham was now supplied at 1s. 6d. per 1000 cubic feet. This was perfectly true; but he forgot to state that in cases where there was a larger consumption, the price was reduced from 1s. 6d. to 1s. 5d., 1s. 4d., and finally down to a minimum of 1s. 3d. per 1000 cubic feet for big quantities of gas. This was an important manner, because the large consumer naturally desired—and he thought it was fair that he should receive—some concession, because he was a wholesale buyer, instead of a retail buyer. It was not in his province to come there and take up the time of the members; but he thanked them very much for the kind welcome that had been extended to him, along with Mr. Barrett and Dr. Davidson, by the retiring President. It was a pleasure to listen to the address; and he would add his praise to that of the mover and seconder of the vote of thanks, because he believed it was an excellent address, and one which would afford food for thought for a great many of the members.

THE EDUCATION OF YOUNG MEN.

Mr. S. R. BARRETT (Fittings Superintendent to the Birmingham Corporation Gas Department) also supported the vote; remarking that it afforded him the utmost possible pleasure to say a word or two in connection with the election of Mr. Rogers to the presidential chair of the Association. From the very intimate association and friendship he had had with Mr. Rogers now extending over many years, he knew the members had done wisely when they elected him President. His knowledge of gas and its distribution, in all its ramifications, was up-to-date; in fact, Mr. Rogers was a man who thoroughly knew what he was dealing with. In connection with the educational portion of the address, it was a delight to him (Mr. Barrett) to know that the Association had so broadened its basis as to give a welcome to every striving young man who wished to come in, and to offer him a helping hand on the first step of the ladder to success; so that the smart, the intelligent, and the industrious working apprentice, the fitter's boy, might look forward to an engineership in the future. This Junior Association had done a very great deal, in his opinion, in assisting the youth in the industry to much higher ambition than had been possessed by it before. He remembered the time when they first introduced the matter of the education of fitters' youths in Birmingham—a step which was forced upon them by the rapid advance in all directions in connection with modern appliances for the use of gas. At that time there were many prejudices to overcome. The practical portion of the work of training was discredited, and it seemed to be generally thought that the scientific part only should be advanced. It was felt by some of them, however, that the two branches should advance hand in hand; and it terminated by the Gas Department having to establish their own schools in order to bring about this result. But it seemed to him that gas companies and corporations really had large powers in their hands. They were nearly always about the biggest ratepayers in the various towns and cities where they were established; and out of the rates the educational rate was one of the heaviest. It therefore appeared to him that the gas undertakings, who paid such high rates, had a distinct claim upon the educational authorities to institute such schools as they might ask for for the further education of young men in the gas industry. In consequence of some such ideas, he believed that the South Metropolitan Gas Company, for all recruits to their staff, were in a position to accept applications from those young men who were able to produce certificates of having passed their technical and scientific examinations in gas manipulation before obtaining appointments with a gas undertaking. If the members of the Association would try and induce the various gas undertakings with which they were connected to look at the matter from the point of view of the ratepayer who contributed something for which he ought to have some return, he thought it would be very beneficial to the gas industry at large. This was a matter which he had been anxious to bring forward, and which he had discussed once or twice with their President. He knew Mr. Rogers had his heart in his work; and he felt certain that, during his year of office, he would keep to the front the question of the education and advancement of those who desired to get on.

The vote was carried by acclamation; and

The PRESIDENT, in acknowledging it, said all he asked the members to do was to attend the meetings and visits, and let the existence of the Association be made known to those of their colleagues who were not already members, so that at the end of the year it might be still stronger in numbers than at present.

UNIVERSITY LECTURES.

The HON. SECRETARY (Mr. W. J. Pickering) said the members had already heard what progress had been made with regard to the proposed University lectures. The dates for two of the lectures by Professor Burstall had been definitely fixed between now and Christmas—one on Nov. 6, the other on Dec. 5, in the University Buildings, Edmund Street, at 7 p.m. Any member who wished to introduce a friend must, when applying for a ticket, give the name and professional status of that friend; for it was desired to assure the attendance of only those who were likely to appreciate and derive benefit from the lectures. For this session, at any rate, no charge would be made. There would probably be four lectures arranged for after Christmas, making six in all. When the tickets were sent out, he would also enclose a syllabus which Professor Burstall had already drawn up, so that all the members would have an outline of the lectures.

PRINTED TRANSACTIONS—ASSOCIATION MEMBERSHIP.

The HON. SECRETARY said it might have occurred to the members generally that those who took the new volume of Junior Gas Association Transactions as well as those of their own Association, were getting as it were a double dose. The arrangements could not be altered for this session; but at the next annual general meeting they proposed to do away with their own book of Transactions (which was now given to the members), if the members were willing to take the Joint Transactions at a reduction off the published price. He did not think anyone would demur at paying what was necessary for the Joint Transactions; for they made an exceedingly handsome volume, and were well worth the price that would be charged for them. Mr. Holton wished to know at the earliest possible moment how many of these Joint Transactions would be needed for the session now starting; and members who wanted copies must therefore say so at once. There were a number of new applications for membership; and these would bring the roll of the Association up to about 180, which he regarded as gratifying.

MR. BYWATER'S NEW APPOINTMENT.

The PRESIDENT said the Association would like to congratulate their honorary member Mr. F. J. Bywater on his appointment as Station Engineer at the East Greenwich works of the South Metropolitan Gas Company. Mr. Bywater was the first President of their Association; and they still remembered the able address he gave them in that capacity. Mingled with their congratulations, would be a feeling of regret at having to part with him. He moved—"That the congratulations of this Association be tendered to Mr. Bywater on his appointment to East Greenwich."

Mr. SMART seconded the proposition; and it was agreed to.

STEAM V. GAS FOR EXHAUSTER MACHINERY.

The meeting concluded with a long and lively informal discussion (which was opened by Mr. Johns) on the use of steam or gas for the driving of exhauster machinery.

THE PROGRAMME FOR THE SESSION.

The following is the programme for the remainder of the session: Nov. 4, a visit to Messrs. John Wright and Co., Aston. Nov. 18, a visit to the International Gas Exhibition, Agricultural Hall, London. Dec. 9, a paper on "Coal Gas Purification," by Mr. Harold E. Stone, of the Central Laboratory, Birmingham. Jan. 13, 1912, a paper on "The Distribution of Gas: Problems and Solutions," by Mr. James Hewett, Distribution Engineer, Birmingham. Feb. 10, a visit to the Smethwick Gas-Works. Feb. 23, a paper entitled "Investigations on Coal Tar and some of its Products," by Messrs. A. R. Warnes and W. B. Southerton, of Messrs. J. Hardman, Limited, Birmingham. March 9, a paper

entitled "Notes on Internal Fitting Work," by Mr. W. L. Westbrook, Hereford. March 22, a paper on "High-Pressure Gas," by Mr. E. W. Smith, M.Sc., High Pressure Gas Laboratory, Birmingham. April 13, a visit to the Cannon Iron Foundries, Bilston. In May there will be a summer excursion, to which ladies will be invited. The date and place will be announced later.

REPORT OF THE GERMAN COMMITTEE ON INTERNATIONAL SCREW-THREADS.

The Committee of the German Association of Gas and Water Engineers, which was appointed in 1909 to report on the question of the adoption of a uniform international screw-thread for gas apparatus, which had been raised by the formation of an International Commission at Paris some years previously, has issued a report recently.

It is remarked that it had become obvious that the question could not be limited to the threads of gas apparatus, but would have to be extended to threads of pipes and fittings in general. As a consequence, a Committee was appointed consisting of representatives of the German Association of Gas and Water Engineers, with four representatives of the Association of German Engineers, one representative of the Union of German Central Heating Engineers, two representatives of the German Society for Mechanics and Optics, seven representatives of firms of tube makers, two representatives of makers of fittings, and four representatives of Swiss Technical Associations. This representative German Committee held a meeting at Frankfort on Oct. 5, 1910. In order to facilitate procedure, a statement was laid before it of the conclusions of earlier Committees, and of the standards adopted by the more important German tube works. The statement gave first the threads adopted in 1896 for water-meters by the German Association of Gas and Water Engineers; then the system of threads agreed to by the International Congress which was held at Zürich in October, 1898; next the threads for gas-pipes passed at the general meeting of the Association of German Engineers at Munich in 1903; then the system favoured by the German Society for Mechanics and Optics, and approved at its meeting at Kiel in 1905. The system of British standard screw-threads worked out by the Engineering Standards Committee, which was appointed in 1902, and reported finally in November, 1909, was next stated; and this was followed by the international system for gas threads which had been provisionally recommended in June, 1909, as the result of meetings held at Paris. The statement included tables and diagrams showing clearly the differences between the more important of the foregoing systems.

The meeting held at Frankfort on Oct. 5, 1910, had also before it a statement of the threads adopted by the different German and Swiss firms of tube makers for pipes from $\frac{1}{8}$ inch to 4 inches in diameter. The conclusions of the German Committee were communicated under date of Oct. 7 to the members of the International Committee on Screw Threads for Gas Apparatus by Sir (then Mr.) William H. Lindley, who had acted as Chairman of the German Committee. These conclusions came before the meeting of the International Commission on Screw Threads which was held at Paris under the presidency of M. Coze on Oct. 19 and 20, 1910, as mentioned in the "JOURNAL," Vol. CXII., p. 505.

This meeting of the International Commission was attended by three representatives of England, fourteen of France, five of Germany, one of Italy, four of Switzerland, and two of the United States of America. After some discussion in a plenary sitting of the Commission, a Committee, consisting of one representative of each nation, was appointed to investigate and report to the Commission on the questions of: The angle, the pitch, the length of thread at the end of the pipe, and the location of the standard diameter of the thread with conical threads.

In regard to the angle, an agreement was not arrived at. The English, German, and Swiss representatives advocated the maintenance of an angle of 55 degrees, with rounding-off by one-sixth of the depth at top and bottom, giving a depth of thread of 0·64 of the pitch. The representatives of the United States advocated an angle of 60 degrees truncated by one-eighth of the depth at top and bottom, giving a depth of thread of 0·65 of the pitch. The French representatives advocated an angle of 60 degrees, but did not finally press their views. The Italian representative stated that he would fall in with the decision of the French delegates. The President suggested that the question should be referred for further discussion to the Associations which had appointed the delegates.

In regard to the type of thread on the ends of pipes and in the sockets, the representatives of England and the United States were in favour of the conical form, and the representatives of Germany and Switzerland of the cylindrical form. As with suitable dimensions both forms of thread can be used together, it was agreed that both the conical and the cylindrical threads should be permitted in the international system, and that with conical threads sockets tapped either cylindrically or conically might be used when required. In regard to the taper of the conical thread, it was decided that the increase in diameter should be one-sixteenth of the distance from the end of the pipe.

The location of the standard diameter of the thread with conical threads—*i.e.*, its distance from the end of the pipe—must be dependent on the new conclusions as to the different diameters of tubes. The English and German representatives were requested to report thereon to the next sitting of the Commission. In regard to the minimum length of thread permissible on the ends of pipes, an agreement was arrived at which embodied substantially the measurements which had been agreed upon at the Frankfort meeting of German representatives earlier in the month,

In regard to the pitch, the French representatives recommended 1·4, 1·8, and 2·3 mm., which had been adopted earlier by the International Commission. The German and Swiss representatives pointed out that a pitch of 1·4 mm., or 18 threads to the inch, was too large for the small pipes, as it would require too fine a thread. They advocated the maintenance of the usual pitches, —viz., 28, 19, 14, and 11 threads to the inch. The representatives of England and the United States agreed with this, though the latter preferred 18 instead of 19 threads for the two sizes of pipes in which the latter occurred, and this was agreed to. It was desired to make the measurements agreed upon expressible in terms of the metric system; and ultimately it was decided to express the pitches adopted as 110, 71, 55, and 43·3 threads to 100 mm. The difference between the corresponding figures—namely, 28, 18, 14, and 11 threads to the inch—is quite negligible. The French representatives desired to consult their technical Associations and report their instructions at the next meeting of the International Commission.

The question of the standard diameter of the screw was one to which the English, German, Swiss, and American representatives attached the greatest importance, as on it depends the applicability of tubes and fittings having the international threads to tubes and fittings made with existing threads. Ultimateiy diameters were agreed upon which in thirteen cases were the same as those adopted at the Frankfort meeting of the German delegates, in five cases deviated from the latter by 0·2 mm., and in only three cases showed a greater deviation.

The results of the conclusions of the International Commission have been tabulated; but they await confirmation or adoption by the several National Associations. The following tabular statement shows the figures approved by the Paris meeting of the International Commission.

Standard Threads Recommended by International Commission, Paris, Oct., 1910.

Nominal Internal Diameter of Pipe.		Diameter of Thread.		Pitch.		Length of Thread at End of Pipe.	
Mm.	Inches.	Mm.	Inches.	Threads to the Inch.	Threads to 100 Mm.	Mm.	Inches.
3	$\frac{1}{8}$	9·8	0·386	28	110	9·5	0·37
6	$\frac{1}{4}$	13·2	0·520	18	71	11·0	0·43
10	$\frac{3}{8}$	16·8	0·662	,,	,,	12·5	0·49
13	$\frac{1}{2}$	21·0	0·827	14	55	14·0	0·55
16	$\frac{5}{8}$	23·0	0·906	,,	,,	15	0·59
19	$\frac{3}{4}$	26·4	1·040	,,	,,	16	0·63
22	$\frac{7}{8}$	30·2	1·188	,,	,,	17	0·67
25	1	33·0	1·300	11	43·3	18	0·71
29	$1\frac{1}{8}$	38·0	1·495	,,	,,	19	0·75
32	$1\frac{1}{4}$	42·0	1·653	,,	,,	20	0·79
38	$1\frac{1}{2}$	47·8	1·881	,,	,,	22	0·87
44	$1\frac{3}{4}$	53·8	2 118	,,	,,	24	0·95
51	2	59·8	2·353	,,	,,	26	1·02
57	$2\frac{1}{4}$	65·8	2·590	,,	,,	28	1·10
60	$2\frac{3}{8}$	72·6	2·860	,,	,,	29	1·14
63	$2\frac{1}{2}$	75·2	2·960	,,	,,	30	1·18
70	$2\frac{3}{4}$	81·6	3·212	,,	,,	32	1·26
76	3	88·4	3·480	,,	,,	34	1·34
83	$3\frac{1}{4}$	94·0	3·700	,,	,,	36	1·42
89	$3\frac{1}{2}$	101·0	3·977	,,	,,	38	1 50
95	$3\frac{3}{4}$	106·6	4·200	,,	,,	40	1·57
102	4	113·6	4·472	,,	,,	42	1·65

Gas Companies' Protection Association.—We learn from the Secretary (Mr. Fred. E. Cooper) that the fourteenth annual meeting of the Association will be held at the Westminster Palace Hotel on the 30th inst. The business will consist of the reception of the annual report and accounts, and the election of six members of the Committee in place of those retiring—viz., Mr. Thomas Berridge, Mr. Frank Bush, Mr. H. Hart, Mr. H. E. Jones, Mr William King, and Mr. W. R. Phillips. With the exception of Mr. King, all these gentlemen offer themselves for re-election.

"Technical Methods of Chemical Analysis."—We have received from the publishers, Messrs. Gurney and Jackson, of Paternoster Row, Parts I. and II. of Vol. II. of the English translation of the latest German edition of Dr. George Lunge's great work on the above-named subject, which is edited, and the text adapted to English conditions of manufacture, by Dr. Charles A. Keane, the Principal and Head of the Chemistry Department of the Sir John Cass Technical Institute, London, in collaboration with a number of technologists. Pending the more extended notice of the volumes which is in preparation, it may be mentioned that they contain chapters on the following subjects in which "JOURNAL" readers are more especially interested: "Illuminating Gas and Ammonia," by Dr. O. Pfeiffer, Chemist to the City Gas and Water Works of Magdeburg, revised by Dr. Harold G. Colman; "Coal Tar," by Dr. H. Kohler, of Berlin; and "Calcium Carbide and Acetylene," by Dr. Lunge and Dr. E. Berl. The price of the two parts is £3 3s. net.

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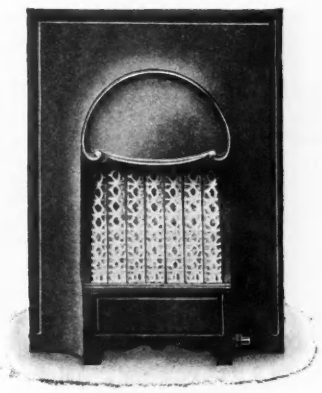

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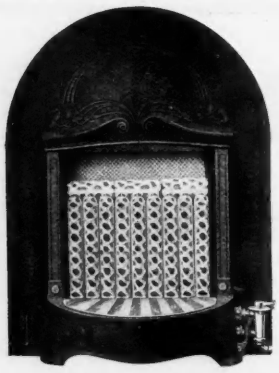

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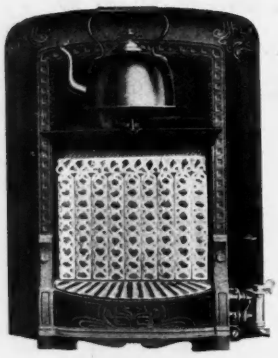

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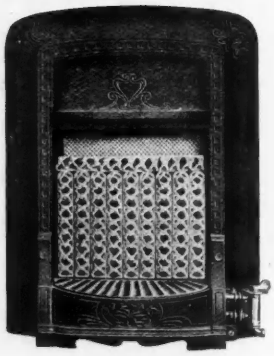

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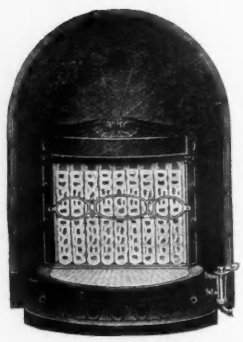

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THE FITTINGS AND SALES DEPARTMENT.

By R. J. Rogers, of the Birmingham Gas Department.

[A Presidential Address to the Midland Junior Gas Association, Oct. 14.]

In choosing a subject for my address, it was natural that I should focus my attention on the section of the industry with which I am more intimately connected—viz., the fittings and sales of gas department. During the comparatively few years in which this Association has been in existence, many developments of far-reaching importance have taken place; and the necessity of devoting attention to the commercial section of our organizations, and the activity and vigilance required by those engaged in it, become daily more apparent.

MEETING COMPETITION.

Competition in many directions, the application of science in the construction and adaptation of gas-consuming apparatus, together with the multiplicity in types and design of same, have created the necessity of establishing a new department in the industry, whose duty it is to combat this competition, and to demonstrate in every possible direction the many uses to which gas may be applied. The committees and directors of most gas undertakings now realize that considerable attention should be concentrated on the commercial branch of their undertakings; and perhaps to no one is the necessity for so doing more apparent than to those actually engaged in the work of such branches, who come into intimate contact with the users of gas, and who are cognizant of the incursions of the electric supply companies into what have hitherto been recognized as being our own fields of supply.

Competition is daily becoming more keen, whether it be for lighting, power, or heating, and there is but little doubt in my mind that this competition will increase in the future. We, as an industry, however, may feel assured that, provided we appreciate the true circumstances in which we are placed by our various competitors, and organize our forces to meet the same, sales of gas will increase, the basis of our supply will be broadened, and the future will offer to us equal, if not greater, possibilities of developments than those which have characterized the proud progress of the industry in the past. I have said, "We must appreciate the circumstances in which we are placed by our competitors;" and I would emphasize this statement, because it is only by a true conception of our rivals' powers that we shall be able to correctly marshal our forces in order to meet this inevitable competition, and to repudiate the erroneous statements often so flippantly made by our rivals and which are calculated to affect our business adversely if we do not take proper steps to refute them.

JUNIOR ASSOCIATIONS AND THE PUBLICITY MOVEMENT.

Most of you are aware that a Joint Publicity Committee has been established by the Institution of Gas Engineers with the object of bringing the various claims of gas before the public, and protecting the industry from the insidious attacks made by its competitors. The Electricity Publicity Committee has been in existence for some time, and has been carrying out educative propaganda work throughout the country; and it is only by means of the combined action of the gas industry, on the lines suggested by the preliminary Committee, that we may expect to maintain our supremacy as suppliers of light, heat, and power. The influence of advertisement or publicity to sections of the general public is undoubtedly productive of business, as may be instanced by the prosperity of those firms who have long realized the value of bringing their commodities before the public by this means. We must hold in mind the fact that we have no longer a monopoly in the supply of light, heat, and power, and must take steps to see that the public are apprised of the value of the commodity we sell for various purposes.

The members of the gas industry may congratulate themselves that the Publicity and General Purposes Committee has been able to formulate such a comprehensive and laudable scheme as the one proposed in the formation of "The British Commercial Gas Association," particulars of which were outlined in the "Journal of Gas Lighting" for Oct. 3. The painstaking efforts and the ungrudging service which the President of the Institution and the members of the Committee must have devoted to the consideration and organization of the constitution and rules call for the admiration and praise of all the workers in the industry. The increasing need of such an Association is recognized, and the proposals of the Committee are especially commendable to those who, like myself, are engaged in the commercial section of an undertaking, and who have felt for some time that there should be established a more intimate and live connection with the Institution of Gas Engineers. The creation of this new Association should provide a still closer bond of union between all sections of the industry; and it is to be hoped that all those engaged in the commercial ranks will respond as far as possible to the appeal of the Committee, in order that the British Commercial Gas Association may occupy the position in the industry which the exigency of modern gas business demands.

The affiliation or representation of the whole of the workers in the gas industry to a central organization is, in my opinion, a *desideratum;* and representatives of the Junior Gas Associations should make it their duty to inculcate into the minds of those in the junior ranks the spirit of co-partnership and comradeship in the great industry in which we are all engaged. The cohesion of all ranks is desired, from the gas-fitter's boy and the junior clerk upwards, in order that the labours of all may be brought to a successful issue.

The objects which the Publicity Committee has in view, and the advantages which the whole industry will undoubtedly derive from such a scheme, should commend themselves to all gas undertakings in the country; and it is to be hoped that the apparent apathy shown by many undertakings at the present time will very shortly give way to a practical recognition of the Committee's proposals, so that the publicity scheme may be actively launched with the whole-hearted support of the gas industry. The duty of carrying out the publicity movement is in the hands of a fully representative body of senior members of the profession. But on us, as juniors, the burden of this duty will ultimately fall; and it behoves all of us, whether engaged in the engineering or the carbonizing section or in the distribution or commercial branch, to equip ourselves with the knowledge and experience which is best calculated to meet the case. We, however, in our junior or subordinate positions in the industry, can materially assist our chiefs in the furtherance of this publicity movement.

Many of our members are connected with associations, guilds, or societies in which it is possible for them to read papers, or by other means to bring the uses of gas before the public, and to refute many statements made by interested members of electrical and other rival communities. Lectures presented in a popular manner—such as "The Hygienic Aspect of Gas Lighting and Heating," "Gas in Relation to Smoke Abatement," and a host of other suitable subjects—might be delivered to remove popular prejudices from the minds of the public. No opportunity should be lost by any of us in this direction; and if this local and individual propaganda work is undertaken by members of the Junior Associations throughout the country, it would greatly assist the objects which the Publicity Committee have in view. Each one of us, whether in the junior or senior ranks, should realize that it is only by such individual interest in the movement that the success and benefit of the whole scheme will be achieved. Let us, therefore, as juniors who hope to take up more responsible positions in the future, and who, as a whole, will be affected more than any other party by the efforts of the publicity scheme, firmly resolve to do all in our power to further the objects of the movement in order to achieve the success which every member of the gas profession desires.

THE UNIVERSITY AND THE GAS INDUSTRY IN THE MIDLANDS.

Probably many of you may remember that when visiting the Birmingham University last December, I suggested, during the votes of thanks to the Senate of the University, that arrangements might be made for a course of lectures to be delivered under the joint auspices of the University and our own Association, on similar lines to those now in vogue at Manchester and Leeds. Professor Burstall, in reply, expressed his opinion that the University authorities would, he thought, if approached, favourably consider the suggestion. Accordingly, your Council, after communicating with the Midland Association of Gas Engineers and Managers, approached Professor Burstall, who very kindly promised to lay the matter before the Faculty of Science in order to obtain their authority to deliver the lectures. Professor Burstall has taken up the matter with enthusiasm, and has promised to deliver a course of six lectures on "The Production of Power from Gases." A copy of the proposed syllabus, together with the dates, times, and place of meeting, will be circulated among the members of the Midland Association of Gas Engineers and Managers, and our own members, in the course of a few days. The first lecture is to be given on Monday evening, Nov. 6, at 7 p.m., at the University, Edmund Street.

The Committee of the Midland Association of Gas Engineers and Managers have expressed their cordial approval of the steps that have been taken to establish a connection between the Birmingham University and the gas industry in the Midlands. The geographical position of Birmingham—situated as it is in the centre, and within easy access of such a large number of those engaged in the gas industry—and the splendidly-equipped buildings of the new Birmingham University, with the many departments dealing with the science and engineering affecting the education of the modern engineer, should go a long way towards strengthening the bond between the University and the industry when once a connection is established. I am sanguine that the co-operation of the University and the local gas industry will lead to the development of the higher education and status of those engaged in the gas profession. The possibilities of development and research that are opened out by the establishment of such a connection with the University must be patent to you all; and I trust the steps which are now being taken may result in benefit to the workers of the whole gas industry.

EDUCATION OF THE GAS-FITTER.

Recently the basis of membership for our Association was broadened in order to admit, as stated on the amended rule, "any person who is engaged at a gas-works, or at a works dealing with the working-up of gas-works residual products, or otherwise associated with gas manufacture and distribution, but who is not engaged in the manufacture of gas appliances." Prior to the alteration of this qualification rule, it was required that the member should hold a recognized official position in the industry, &c. But our Council very rightly realized that for a Junior Association

the basis of membership should be as broad as possible, in order that any junior engaged in the industry who was desirous of participating in the benefits to be derived from membership might do so; and a ready welcome and a helping hand were extended to those who, by reason of the previous rule, had before been unable to become members.

The junior commencing his service in the industry requires assistance before he reaches the "recognized official position;" and it is the duty of the Junior Association to see that this assistance is given. The first plank in the programme of the Junior Association should always remain the educational one, and the value of it to its members. This aspect of the work which has been carried out under the auspices of the Junior Associations in the past, has, I think, been the moving and impelling factor which has contributed most to the success achieved by all the Junior Gas Associations throughout the country. Although stimulus for technical education has undoubtedly been given by the Junior Associations to a section of employees in the service of gas undertakings, the educational benefits have mainly been derived by those engaged in what may be termed the junior official ranks; and there is still something needed to raise the educational status of those engaged in the practical gas-fitting trade.

It is in this direction wherein lies the most pressing need of the moment. Every effort should be made to expedite the formation of classes or lectures throughout the country to increase the technical training of the gas-fitter. Those who come into intimate contact with the fitter know only too well that the formation of suitable classes has been too long delayed. True, there have been for some years past technical classes carried out under the auspices of many of the larger gas undertakings for the benefit of junior gas-fitters and fitters' boys. [The Birmingham Gas Department has provided classes for fitters' boys for the past seven or eight years; and this year has provided lectures, drawing, and practical gas-fitting classes, for juniors engaged in the gas-fitting trade.] In the majority of cases, however, where classes have been held, the student has been obliged to relinquish his studies when he has served his apprenticeship term and carries his own tools, simply because there have been no classes for gas-fitters where he could attend, and follow up the technical training and instruction in the apparatus with which he has to deal, and which yearly becomes more numerous and exacting. This severance from the classes, it must be remembered, takes place at the period in a young man's life when his faculties for grasping the technical instruction are becoming more developed. Such a state of affairs should not exist in these days; and the gas industry should see that the technical education authorities in the various towns are prevailed upon to provide classes for gas-fitters under teachers approved by the local gas undertaking.

All praise is due to those gentlemen in the industry who have been working so persistently for some time to establish classes for the gas-fitter. The chief reason of the delay in commencing universal classes appears to be the question of the method of examination to be adopted at the termination of the instruction course; and the certification suggested also does not appear to meet with general approval. Many gas-fitters throughout the country are keenly desirous of obtaining technical instruction in their trade; but I think the impetus necessary for the success of these classes will only be experienced when the fitter realizes that preference is given by the gas undertakings to those who have obtained a certificate of proficiency. The classes would then be taken up enthusiastically by the majority of gas-fitters throughout the country.

According to the parliamentary report of the 1901 census, there were 16,335 gas-fitters employed in the United Kingdom; and although the report of the 1911 census in this particular is not yet available, the number of gas-fitters in the country at the present time cannot fall far short of 20,000. The magnitude of the gas-fitting business warrants some decisive action being taken by the gas industry to ensure that the educational side of the business is provided for in the way of lectures and classes; and even if a satisfactory basis for examinations cannot be arrived at, steps should be taken to see that the gas-fitter receives the technical instruction which is necessary in order to obtain the efficient discharge of duties which the present-day gas-fitter is called upon to perform.

Personally, I am of the opinion that if the British Commercial Gas Association would approve of a syllabus and course of instruction which could be adopted generally at technical schools throughout the country, the question of the issue of certificates might be left in the hands of the local gas undertaking and the technical education authority. Classes of instruction could, I think, be better arranged by these two bodies to suit the condition of work in each particular locality. Although there may be only one right method of adjusting a bunsen flame to obtain the highest efficiency, whether in a gas-fire, a high-pressure lamp, or a muffle, in many respects the conditions of gas-fitting work vary in different parts of the country. Hence in the North and West of the country, the gas-fitting and plumbing work is more frequently allied than in the Midlands and the South, where the two trades are, I think, usually kept more distinct.

The award of certificates for oral or written examinations should present little difficulty; but the issue of a certificate of proficiency in practical work no doubt does involve difficulties. I think these difficulties could, however, be overcome if the local gas undertaking and the local gas-fitters' trade associations would co-operate in formulating a scheme for practical examinations in each district. Could not some method be devised whereby the examiner should have access for inspection of the work carried out by a gas-fitter in the course of his daily employment? This, to my mind, would be the best method of gauging the ability of the workman in the particular branch of the fittings department with which he was connected. Therefore, I feel that the scheme which would meet with most favour by the gas companies and the gas-fitting trade would be one which would deal with the particular requirements of each locality, and for which the local certificate would be awarded.

HIGH-PRESSURE DISTRIBUTION.

In reading a paper before this Association about five years ago ["JOURNAL," Jan. 8, 1907, p. 95], I ventured to remark that the industry would in the near future be brought into close contact with the question of high-pressure gas distribution, and outlined the circumstances by which, in my opinion, the utility of high-pressure gas transmission would be better realized. Since that time, as you are aware, the subject of high-pressure distribution has received a considerable amount of attention, and installations of varied character have been adopted in all parts of the kingdom. The possibilities of high-pressure gas distribution are manifold; and it is not my intention to recapitulate the many advantages which an undertaking may derive from such schemes of distribution. The advantages and utility of this method of gas transmission must be viewed in the light of the local circumstances of each particular undertaking.

The manner in which a scheme of high-pressure distribution has been carried out in Birmingham is to be the subject of a paper to be presented to the members of the Association by our esteemed Past-President, Mr. James Hewett, the Distributing Engineer of the Birmingham Gas Department; and we are also to be favoured this session by a paper from Mr. E. W. Smith, M.Sc., on "High-Pressure Gas." Both of these gentlemen have had considerable experience in the distribution and application of high-pressure gas; and I am sure their communications will be eagerly looked forward to by us all.

Where the requirements of a district lying at some distance from the gas-works have developed beyond the carrying capacity of the mains at the period of maximum consumption, the provision of a scheme of high-pressure distribution is particularly commendable, especially when we take into consideration the increasing popular demand for systems of high-pressure gas lighting for shop, factory, and public lighting, and in industrial centres a growing tendency for adopting high-pressure gas in appliances where heat is required. Installations of high-pressure gas for shop lighting may, in these circumstances, be more readily carried out; and it is not necessary to obtain orders for a whole terrace of shops in order that the installations may prove profitable to the gas undertaking. Shop lighting may then be treated individually in a similar manner to that obtaining with a low-pressure supply. To an undertaking where such conditions prevail, there can be little doubt as to the justification of employing a system of high-pressure gas transmission.

With the advent of high-pressure distribution, with small mains and efficient governing apparatus, the possibilities of effectively supplying a large area composed of villages, &c., where otherwise supply from the separate gas-works would not prove remunerative, are opened out. Already several such schemes are in operation in various parts of the country; and I feel sure there is considerable scope for development of this system of gas supply to villages adjacent to our large cities and towns. The question of amalgamating the smaller gas-works within a limited area with a view to concentrating the production of gas at one works is one which is worthy of consideration in many districts when a study of a map is made, and holding in view the possibilities of modern gas transmission.

Ere long we may see linked-up to our towns and cities by means of gas-lighted roads many villages, the consumption of gas in which would prove remunerative to the gas undertaking and a boon to the inhabitants and public at large.

In the absence of a general system of high-pressure mains, and where a parade or terrace of shops requires a service of high-pressure lamps, or a factory requires a supply of compressed gas for any purpose, the question of providing separate compressors, mains, and services for such supply is the great factor involved, affecting the economy in using compressed gas for such purposes. That the supply of high-pressure lighting, however, from separate compressors has been successful is proved by the manner in which such systems of lighting have been adopted by shopkeepers in London and the Provinces, and by the increasing demands made for this system of supplying illumination. The 1000-candle power high-pressure lamps with single mantles have undoubtedly found great favour among shopkeepers, and the "ready-to-serve" method with which the gas undertakings have dealt with the matter is to be commended.

HIGH-PRESSURE SHOP LIGHTING IN BIRMINGHAM.

Since we have laid high-pressure mains in a few of the chief thoroughfares in Birmingham, we have been able to offer high-pressure lamps for the exterior lighting of shops. The lamps in use at present are of the Keith and Blackman, and the Breeden "U K" single mantle 1000-candle power types; and during the past year we have received orders for upwards of 140 lamps of 1000-candle power each. Now that the lighting season has commenced, we are receiving many applications for these types of lamps. The Gas Department supply and fix them on hire terms,

including gas, maintenance, and labour, at a charge of £5 per lamp per annum; the lighting and extinguishing of the lamps being under the control of the consumer. The number of lighting hours necessarily varies in different business premises; and the only restriction for lighting which is made by the department in supplying lamps on these terms, is that the lamps shall only be lighted during the usual lighting hours, and when the premises are open for business. From my experience in Birmingham, I find that the shop-keeper prefers to turn his lamp on and off as he may require, rather than that the control should be in the hands of the Gas Department fitter.

In order to cater for the window lighting of premises in dark portions of arcades, &c., where lamps are required during the hours of sunlight, and also to meet the requirements of many shop-keepers whose premises are closed at an early hour, and who do not require the lighting during the summer evenings, a separate system has been adopted, whereby the shop-keeper agrees to pay an annual amount for the hire and maintenance of the lamps, and is charged for the gas according to a schedule based on the number of hours they will be alight each month. The shop-keeper signs an agreement that the lamps shall only be used during the hours in each month specified on the agreement forms, and also agrees to pay an amount per lamp for each additional hour the lamp is in use in excess of the agreed schedule time. This clause is necessary to cover the period the lamps may be required during sale times and other occasions which cannot be foreseen when the agreement is signed. Most of the establishments we have supplied with lighting on these terms have a definitely arranged hour for closing the shop; and the lamps are not kept alight after the doors are closed. This system of charging on agreed terms according to the hours the lamps are in use, certainly appeals to the shopkeeper as being a more equitable basis for charging, as the shopkeeper who closes at (say) 7.30 p.m. objects to pay the same as his neighbour, who does not close his premises so early, and who requires his lighting until (say) 9.30 or 10 p.m.

I do not propose this afternoon to enter on the subject of high-pressure gas-lighting generally, or to quote statistics relating to the charges or maintenance of this system of lighting. But there is one point I should like to mention, and that is the breakage of the globes on high-pressure lamps. The renewal of globes comprises a considerable item in the maintenance of these lamps; and I think this is a point to which the makers of the lamps should still further direct their attention. In some of the installations of high-pressure lamps, 1000-candle power nozzles are used in 1500-candle power lamp bodies; and in this way the life of the globe has been considerably increased. This fact proves, I think, that there is room for improvement in the construction of 1000-candle power lamp bodies, to accommodate the high-pressure burner of this unit. Apart from the cost to the gas undertaking for renewals, the annoyance to the consumer caused by the breakage of the globe has to be considered.

What effect on such schemes of high-pressure shop lighting the advent of the high-power low-pressure four-burner lamps of 1000-candle power will have, remains to be seen. That this type of lamp has already found favour for street-lighting purposes is evidenced by the fact that in Budapesth 2000 low-pressure Graetzin lamps are now being installed—mostly of 600 and 1000 Hefner power (549 and 915 English candle power) respectively. Also in Berlin a large number of these lamps have been in use some time; and their efficiency so nearly approximates that of the high-pressure lamp as to considerably reduce the margin of choice between high and low pressure lamps for large unit lighting, especially when the extra cost of installing high-pressure lamps is taken into consideration. The arrival of these very efficient low-pressure lamps should prove most acceptable and opportune to gas undertakings where high-pressure mains are not yet installed, and where the competition of the electric arc and cluster filament lamps has recently been felt.

The prevailing cry both for shop and public lighting appears to be for a higher standard of illumination per candle foot; and the standard which appeared to be ample even a comparatively short time ago seems to be, in the view of present-day practice, insufficient. As to how far the public taste in this direction will develop may only be conjectured; but I think we in the gas industry may congratulate ourselves that, whatever standard of illumination, or the degree of light distribution, may be desired by the public, we are able to more than hold our own against the illuminants of our rivals.

ILLUMINATION—STREET LIGHTING SPECIFICATIONS.

During recent years, a considerable amount of attention has been bestowed on the study of illumination. The formation of an Illuminating Engineering Society in this country, on similar lines to the American Society of the same name, has no doubt aroused interest among lighting authorities and others engaged in illumination problems. The Council of the Society contains representatives of different interests, trades, and professions concerned with illumination and allied subjects; and it has for its objects the advancement of the theory and practice of illuminating engineering, and the dissemination of knowledge relating thereto.

The question of framing a standard specification for street lighting is now occupying the attention of a Special Committee appointed by the Illuminating Engineering Society, with whom are co-operating the Institution of Electrical Engineers and the Institution of Gas Engineers. That there is need for such investigation is generally acknowledged; and although it may not be possible to define a standard to suit all conditions and requirements of public lighting, it is desirable that some universal agreement as to the basis of lighting contracts should be determined. Opinions of lighting experts and other interested parties differ considerably as to the terms and standards which should constitute the basis of lighting contracts. The subject is one which will necessitate careful deliberation by all concerned, before an agreement as to a standard specification is attained. Having regard to the position of gas as the premier illuminant for street lighting, it is needless to say the opinion of gas lighting experts should be well represented in this discussion of standard specification; and the Institution of Gas Engineers will no doubt see that the interests of the gas industry in this direction are amply safeguarded.

The agreement by Great Britain, France, and the United States on the Standardization of an International Candle may be regarded as a step towards eliminating the confusion existing in the terms of candle power stated in foreign countries and our own.

With regard to the movement for the abolition of the illuminating power tests, it is interesting to note that the International Photometric Commission, at their recent conference, recommended the substitution of the calorimeter for the photometer for testing the quality of towns gas. The question of a standard calorific value test is one which must necessarily have a bearing on the sales of gas in the future. The efficient working and the utility of the majority of gas appliances depend to a large extent on the calorific value of the gas. With the gradual displacement of flat-flame burners by those of the incandescent type, the usefulness of an illuminating power test is considerably reduced, and to meet the requirements of the present-day demand, a single test for calorific value is desirable. In many districts a considerable number of flat-flame burners are still in use; and where these conditions obtain, efforts should be made to induce the consumer to adopt incandescent lighting.

GAS SUPPLY AND PRESSURE.

To obtain the highest possible efficiency in all types of gas-burners and gas apparatus, is the object of all suppliers of gas; and the necessity for maintaining adequate and uniform pressure at the point of ignition must be continually borne in mind. To attain this end, many methods of controlling pressures may be resorted to. The fixing of district governors on mains, after careful study of the consumptions and pressures in various divisions of the gas-supply area, may result in a comparatively straight line being given on the pressure chart at the consumer's meter. But this does not necessarily ensure that a uniform pressure is delivered at all times at the point of consumption. Some undertakings prefer to fix an individual governor on each consumer's service, and by so doing enable the gas-fitter to properly adjust in the day-time incandescent burners, gas-fires, and other appliances with the knowledge that, no matter to what extent (within reasonable bounds) the main's pressure may vary during the twenty-four hours, the consumer will not be called upon to make any further adjustments in order to maintain a satisfactory lighting or heating service. Then, again, separate governors may be fixed on individual apparatus; and this latter method is no doubt the only means whereby the maximum efficiency of the apparatus is likely to result, as each appliance may by this means be governed to the pressure at which it is found the highest efficiency is given.

As in the chief distributory system in many towns the modern demand has exceeded the capacity of the existing mains, so in the consumers' premises has the demand exceeded the capacity of the original supply pipes in the building; and as in the mains higher initial pressures have to be provided to satisfy the present-day requirements. Likewise in consumers' pipes the pressure needs to be higher in order that the requisite volume of gas may be delivered to the apparatus. We are all, I suppose, aware of the number of complaints that are traceable to defective house piping, caused either through the inadequate sizes of the pipes used in the installation or in the manner in which such pipes have been laid down. No efforts should be spared by gas undertakings to remedy the state of affairs which now exists in relation to the fittings of gas-pipes in premises.

No universal scheme of pressure supply is possible under the existing conditions of piping arrangements obtaining in various towns; and the question of maintaining more uniform pressures at the point of consumption is one which every undertaking must consider in regard to the conditions existing in their own particular locality. This question of pressure is most important, and is one in which a considerable amount of attention will have to be given in the future if we are to maintain satisfied consumers and obtain new business.

TOWN PLANNING IN RELATION TO GAS SUPPLY.

In the case of garden cities or new townships, it would be possible to obtain fairly uniform pressures in consumers' premises, provided the gas supply authorities were given power to insist on certain specification of piping being carried out, and by governing the main to give a constant pressure at the inlet of meters. The question of town-planning is now engaging the attention of many local authorities; and I think the time is opportune when those gas undertakings in whose areas these town-planning schemes are being promoted, should take the steps necessary to obtain such clauses in all town-planning schemes as will ensure that a satisfactory system of gas-piping is installed in all houses erected

under the Town Planning Act. Adequate provision should be made for the use of gas for lighting, heating water, gas-fires, and cooking purposes. A satisfactory service of gas in modern houses should be looked upon as a necessity; and if the greatest possible benefit is to be derived by the public from the use of gas, the local gas authority should be in a position to specify the sizes of pipes necessary for such service, and be authorized to approve of all installations.

Much of the "jerry" carcassing of houses at the present time is due to the price-cutting competition which takes place in the private gas-fitting trade; but with the closer union and co-operation between the gas undertakings and the trade (which, it is to be hoped, will be soon accomplished) the adoption of a standard specification and inspection of gas installations should not be long delayed.

TOWN GAS IN RELATION TO POWER SUPPLY.

In an industrial centre like Birmingham, comprising as it does manufactures of varied character necessitating the use of power-driven machinery, the question of power costs is naturally studied very closely by the manufacturer; and the value of the power load to the Gas Department is, as may be readily imagined, somewhat considerable. About five or six years ago, during what may be termed the suction producer plant boom, the question of the comparative costs of town gas and producer gas figured very prominently in manufacturing circles; and a campaign in favour of the substitution of producer gas plants for town gas supply was energetically carried out by the makers of the plants and other interested parties.

At the end of 1905, the price of gas for power purposes in Birmingham was as follows: Under 100,000 feet per quarter, 1s. 11d., less 5 per cent.; 100,000 feet and upwards per quarter, 1s. 7d., less 5 per cent. The average price of anthracite coal at this period was 24s. per ton, delivered on the premises. Most frequently the vendor of the plant, in showing the costs of working producer plants, only calculated the cost of the anthracite coal and the water, and did not enlighten the manufacturer as to the other necessary items of expenditure consequent on the adoption of a plant. Items, such as the cost of converting the engine to work satisfactorily on the lower-grade gas; floor space occupied by the plant, coal, and ashes; cost of removal of ashes; the difference in horse power developed by the engine owing to the difference in calorific value of the two gases; cost of renewals and repairs to generator; and other items representing time and money to the manufacturer—were all left out of calculation, and only realized by the user after the installation and his experience in the use of the plant.

Notwithstanding the fact that the Gas Department took steps to draw the manufacturers' attention to the true comparative costs of working with the two systems of power production, many manufacturers were induced by the specious offers of plant makers to instal suction-gas plants. That the claims of the plant makers as to the economy of their system of power did not prove to be correct was very shortly made evident. Many manufacturers quickly abandoned the use of the plant—in some cases, after only a few months' use—because of the unsatisfactory working and expenses attached to the running of it. There being no ready sale for the second-hand producer plants, the manufacturer had frequently to rest content with a loss of the initial outlay on the plant and its accessories (in some cases a considerable item) and return to the use of town gas—declaring that his faith in the economical working of town-gas driven engines would not be lightly shaken by offers of so-called enormous savings to be obtained by the adoption of other rival systems of power.

So far as could be ascertained in 1906, the number of producer-gas plants of various powers employed in Birmingham was 150; and although the charge for power gas since that period has only been reduced to 1s. 6d. per 1000 cubic feet, less 5 per cent., it is, I think, striking testimony to the position of town gas for power purposes at the present time, when it is stated that the number of producer plant users in Birmingham has fallen to sixty in 1911. This gratifying reduction of 60 per cent. in the number of plants in Birmingham during the five years under notice does not, however, represent the true feeling of power users in this matter.

A large number of the manufacturers who are still using producer plants of various powers have informed me from time to time that, though they are continuing to employ producer gas for their engines, the only reason for so doing is that they have expended a considerable sum in the initial installation of the plants; and as there is no market for the sale of same, they cannot afford to abandon the plant until such time as the repairs and renewals require to be carried out. When this time does arrive, it will not pay them to expend any more money on the plant; and their return to the use of town gas cannot be long delayed. These admissions of the power user, after first-hand working knowledge of suction producer plants, together with the reduction of 60 per cent. I have referred to, indicate, I think, that, for the great majority of engines, town gas has not now, as at one time supposed, a very formidable competitor in the suction-gas plant.

INSPECTION OF GAS-ENGINES.

The necessity for the periodical examination and testing of gas-engines on consumers' premises should now be realized by every gas undertaking, in order to ensure that the highest possible working efficiency is obtained from the engine. It is imperative that the satisfactory and economical working of a consumer's engine should be ensured by the suppliers of gas. A gas-engine working under unsatisfactory conditions may be supplanted by other means of power, and a valuable consumption lost to the gas undertaking, if steps are not taken to ensure that the utmost efficiency is obtained. Inspection and indicating work carried out by a gas undertaking would be amply repaid; and no efforts should be spared in this direction.

Competition with engines using town gas is rapidly increasing. Very cheap rates are now offered by the electricity companies for current employed for power purposes in their endeavour to increase the day load from their generating stations; and although electric motors for small power may have an advantage in working under special circumstances, the running of motors in works for continuous use is still more expensive than gas-engines.

Improvements in the working of oil-engines of the Diesel type, and developments in suction and producer plants, have recently been made whereby the running costs of engines working on these systems have been reduced; and the competition with town-gas driven engines becomes more keen.

Although these systems of power production concern more particularly the large power user, who has hitherto employed steam, the necessity for keeping a watchful eye on the performances of our rivals is apparent. The majority of gas-engines working on town gas in most districts range up to 50 H.P.; and considering the efficiency and reliability in working, and the very favourable charges for power gas now obtaining at most undertakings, the gas-engine well maintains its position against its rivals for power purposes. In the area supplied by the Birmingham Gas Department, there are upwards of 3000 gas-engines now in use of various horse powers.

NATIONAL TESTING LABORATORY FOR THE INDUSTRY.

The establishment of a central testing laboratory to be conducted on practical lines is a matter which, in my opinion, is worthy of the consideration of the gas industry. With the daily increasing number of appliances of all description—such as high and low pressure burners and lamps, governors, meters, valves, gas fires, ccokers, furnaces, muffles, gas-heated hot-water circulators, and a host of other apparatus—it is almost impossible for the small or medium-sized undertakings to carry out tests of all these appliances under conditions such as they would desire. Besides, there is necessarily a considerable repetition of tests of the same apparatus made by various gas undertakings. In the larger undertakings in the country, where fully-equipped laboratories exist, it is no doubt preferable that tests should be undertaken by such individual concerns, as in them means are to hand for carrying out tests in the most efficient manner. These might remain as at present; but the idea I have more particularly in mind is for the smaller undertakings, where the gas manager may require reliable information as to tests on (say) some particular lamp, fire, or other apparatus, and where the provision of suitable testing plant might prove costly and out of proportion to the value to the undertaking of a particular test.

In such cases, it would be of convenience, and certainly should result in a saving of money to many gas undertakings—who are often obliged to purchase numberless appliances in order that they may examine same—if some test certificate from a central laboratory were obtainable. Apparatus could be submitted to the testing centre, either by the manufacturer or by a gas undertaking, and tests of varied character could be conducted under conditions which might be specified to suit local or general circumstances. Research work of a technical nature might also be undertaken, and the results published for the information and guidance of the members of the industry.

I am fully aware that there are many difficulties to be encountered in the formation of a suitable testing centre; but I do not think these are insuperable. The question is one which I think might be considered by the new British Commercial Gas Association in connection with the publicity movement. To be able to obtain particulars of reliable tests of new apparatus would be of value to the subscribing undertakings. The issue of reliable data on the comparative costs of gas and electricity for lighting and cooking purposes could be readily obtainable from such a testing centre. The question of the standardization of many gas consuming appliances might be considered in connection with such a laboratory; and standard conditions of testing certain apparatus might be decided upon by a Committee representing the commercial side of the gas industry. There are many other directions in which such a laboratory would be of assistance to those in charge of the commercial sections of gas undertakings; and the possibilities and scope suggested to the mind in the consideration of such a scheme prove, in my opinion, the desirability of such a commercial association as the one so opportunely promoted by the Publicity and General Purposes Committee of the Institution.

HIRE SYSTEMS AND INCLUSIVE CHARGES TO CONSUMERS.

Undoubtedly the great success achieved by gas companies in the additional consumption of gas by the adoption of slot-meter installation schemes may be traced to the inclusive service of meter, fittings, cooker, &c., to the user. The saving of the initial outlay to the public on the purchase of fittings, cookers, or grillers attracted a class of customer who, up to that period, had been unable to avail themselves of the use of gas because of the primary cost of the installation. The experience of the past proves that the consumer does not demur to paying the small extra charge for the gas consumed or for hire of apparatus when supplied at the reasonable hire-rates now in vogue in most undertakings.

Take, for example, the supply and fixing of cooking-stoves for

slot consumers. In many instances 50 per cent. to 60 per cent. increase in the annual gas consumption per consumer has resulted from this policy of supplying cookers on the inclusive charge system to slot consumers. The following table shows the increase in the number of slot consumers, together with the average yearly consumption by these gas consumers in Birmingham.

Year.	Number of Consumers. (Prepayment.)	Average Yearly Consumption.
		Cubic Feet.
1901	13,080	10,839
1906	43,069	12,384
1911	75,578	14,330

It will be noticed that the average yearly consumption per consumer has increased 32 per cent. during the last ten years; and in this connection it must be remembered that many of the slot consumers have adopted the incandescent burner as being the more economical method of lighting. This satisfactory increase in the consumption is therefore due to the increasing popularity of the gas cooker, griller, &c., which are supplied on inclusive terms to slot-meter consumers.

In Birmingham, we commenced in November, 1907, to supply on permanent hire terms, at 1s. 6d. and 2s. per quarter to ordinary consumers, a better class cooker than that supplied to the slot consumer; and the popularity of this system is demonstrated by the fact that at the present time about 11,500 cookers are in use which have been supplied on these hire terms, inclusive of fixing. Although a system of supplying cookers on three years' hire purchase terms had been in vogue for many years previous to the introduction of the permanent hire scheme, it was apparent that a large number of consumers preferred to hire cookers on simple hire terms, to include cost of fixing, rather than purchase their own. At the present time in Birmingham about 90 per cent. of the orders received from ordinary consumers for cooking-stoves are for those supplied under the permanent hire scheme.

GAS-FIRES ON HIRE IN BIRMINGHAM.

Yet another instance may be quoted in which it is proved the consumer appreciates the system of simple hire of gas apparatus. During the month of August, the Birmingham Gas Committee decided to supply gas-fires on permanent hire terms to consumers. Hire charges from 1s. per quarter and upwards are made; this being inclusive of the fixing of the fire with 15 feet of pipe—extra piping being run at the rate of 6d. per foot. A comprehensive series of fires of various makes, sizes, and designs are available by the public. During one complete month—viz., from Sept. 7 to Oct. 6 inclusive—1100 orders for gas-fires on this system have been received; the total from the commencement of the scheme to Oct. 6 being 1320. Applications for these fires are now being received at the average of about sixty per day. Naturally, the influx of work necessitated in the inspection of premises and in the fixing of these fires has taxed our fittings department considerably. Arrangements have, however, been made whereby the outdoor gas-fitters are assisting the Gas Department in the fixing of these gas-fires and other apparatus.

The manner in which shopkeepers and others have taken up the inclusive hiring system of low and high pressure lamps is further proof of the popularity of the system of supplying "illumination" rather than supplying the gas only. What the shopkeeper requires is effective lighting; he does not want to be bothered with the various charges for installation, for maintenance, and for gas consumed, or to be faced with the cost of renewing the apparatus after it has become worn out. So far as my experience goes, he much prefers the inclusive charge system. In like manner these remarks apply to the user of domestic gas appliances. The intrinsic value of the apparatus to the consumer only remains so long as it is giving efficiency and serving the purpose for which it is designed.

Other profitable sources of gas consumption may be traced to this inclusive charge and simple hire of apparatus. Care must, of course, be exercised by the gas authorities in arranging the hire charges of apparatus to ensure that the charge bears relation to the cost of the installation and the probable consumption to be derived from its use.

INCREASING CONSUMPTION AND CAPACITY OF METERS.

The increase in the average consumption per consumer which is likely to result from the increasing use of gas-fires and domestic gas apparatus, raises the question as to the hourly capacity of the meter; and bearing in mind the volume of gas required at the period of maximum consumption in houses where gas-fires and such apparatus are becoming more frequently in use, the question of the meter capacity is one which we shall have to face in the near future. There is a need for a meter which would be acceptable by the gas examiners, having a minimum capacity of at least 60 cubic feet per hour, but which would not occupy more space than that taken by a present 5-light meter. In thousands of houses the position provided for the meter is somewhat restricted; and in many cases it is not desirable to further encroach on the space available for it.

GAS UNDERTAKINGS AND PRIVATE GAS-FITTERS.

Allied to this hire charge and inclusive service system is the effect of the increased work resulting from such schemes on the fittings departments of the gas undertakings and the business of the private gas-fitter. Various interests are involved; and the subject is one which requires careful thought and mutual consideration by both parties. There is no doubt a pronounced popular demand by gas consumers for this style of business, as proved by the foregoing illustrations; and so long as these conditions prevail, it is the duty of the suppliers of gas to cater for this demand in the interests of the general public. The gas industry has an enormous capital at stake, and cannot afford to allow the progress of gas consumption to be checked by the apathy of the private trader in not adapting his method of business to suit the modern requirements of the consumer of gas.

The gas undertakings are, I feel sure, genuinely anxious and desirous that the private trader shall obtain his due share of business and profit resulting from the increase of the fitting business—provided that the private gas-fitter, on his part, will realize the obligation of the gas companies to the general public, and will also see that his employees are competent to carry out the work in accordance with up-to-date practice. Private gas-fitters are in many cases, by arrangement, assisting local gas authorities by fixing meters, fittings, cookers, gas-fires, and other apparatus; and if this spirit of co-operation is extended generally, it cannot fail to result in mutual benefit to both parties. The private gas-fitting trade owes to the gas industry a great deal more than it often realizes, for the publicity work that has been done by gas undertakings in bringing before the public the various improvements and methods in utilizing gas apparatus. The steps that the suppliers of gas have taken in the past have been necessary for the development of the gas sales; and I venture to say that if such steps had not been taken by the gas authorities the position of the private trader would have been far worse than it is at the present day.

Certainly, gas undertakings have advantages of well-equipped show-rooms and other facilities of trading that the private trader has not. But all these are necessary to educate and demonstrate to the public the latest types and uses of gas apparatus; and with the increasing competition likely to be experienced in future, the need for combined effort on the part of gas authorities and private gas-fitters becomes almost imperative. In the interest of the public, of the gas-fitters, and the gas industry, the most cordial relations and harmony should exist between the suppliers of gas and the trade; and it is to be hoped that ere long amicable working arrangements may be concluded between both parties in all parts of the country.

SMOKE ABATEMENT.

The important subject of smoke abatement is now claiming the attention of those who are interested in the health and welfare of the inhabitants of many cities and towns in the country. The formation of a Smoke Abatement League of Great Britain, with affiliated branches in Glasgow, Manchester, Sheffield, Salford, and other places, has resulted in directing public attention to the insanitary and harmful nuisance caused by the emission of smoke from factory and domestic chimneys; and the movement for the abolition of smoke is steadily growing throughout the kingdom. The substitution of steam-engines by gas-engine driven plants has contributed in no small degree to the reduction of factory chimney smoke in recent years; and those interested in the subject generally agree that the solution of the smoke problem lies in the adoption of gaseous fuel for power and heating purposes.

The President of the Local Government Board (the Right Hon. John Burns), when replying to a deputation of the Smoke Abatement League some time ago, expressed sympathy with the objects of the League, and stated that he found on inquiry that the Gaslight and Coke Company and the South Metropolitan Gas Company had between them 1,300,000 gas fires, cookers, ring burners, or hot-water heaters, which must have undoubtedly reduced considerably the smoke nuisance in London. When it is remembered that in most towns the domestic chimney is the chief cause of the smoke nuisance, and in many industrial cities quite 50 per cent. of the smoke is emitted by the domestic house chimney, it will be realized that the continued increasing use of gas-fires in such cases will greatly minimize the smoke evil.

The reduction in the price of gas, together with the presence of improved types of gas fires, radiators, hot-water circulators, and other appliances, are no doubt factors which are contributing to the successful adoption of town gas as a heating medium; and the solution of the smoke problem will, in my opinion, only be realized when the public have become educated in the use and economy of gaseous heating. Each decrease in the price of gas enables us to compete more favourably with other systems of heating having raw coal for fuel, and results in the substitution of coal by the more scientific and efficient medium of coal gas.

All gas undertakings should support the work of the Smoke Abatement Societies. By so doing they will not only obtain considerable increase in their sales of gas, but will also be assisting a movement which has for its object the purification of the air and the betterment of the health and surroundings of the inhabitants of our towns and cities. The quotation "Join we together for the public good in what we can" [King Henry VI.] is suggestive of the attitude with which gas suppliers should view this subject of smoke abatement.

The coming session will be a memorable one for myself; and I shall do my utmost to make it as so to every member of the Association. All I ask is that you should loyally support your Council in every possible way, and endeavour to attend as many meetings and visits as possible, because in doing so I feel sure you will increase your knowledge of the profession.

NEW METHODS OF GAS ANALYSIS.

Two papers on gas analysis have appeared in a recent number of the "Journal für Gasbeleuchtung," and summaries of their contents are given below.

ANALYSIS BY FRACTIONAL COMBUSTION.

The first paper is a communication from the Chemical Technical Institute of the Technical College at Carlsruhe, by Messrs. L. Ubbelohde and de Castro, on "Gas Analysis by Fractional Combustion." The authors review first the work which has been done, since Davy observed that explosive mixtures of gases burned slowly without flame below their temperature of ignition, in the direction of utilizing this phenomenon in the analysis of gas. The most important catalytic or contact substances for accelerating this combustion belong to the platinum group of elements. The action of palladium in particular has been studied by Haber and Weber; while cupric oxide has been investigated for fractional combustion by a number of observers. This material has been used in the laboratory of the Carlsruhe Chemical Technical Institute for about two years. Fractional combustion takes place with it in two stages. At 265° to 270° C., only hydrogen and carbonic oxide are burned; at a bright red heat of 800° to 900° C., methane and ethane are burned, and nitrogen is left as a residue. The resultant water separates, and the carbonic acid formed occupies the same space as the original carbonic oxide and methane, (but double the space of the ethane), which have been burned. The changes of volume, in conjunction with the measurement on absorption of the carbonic acid produced, make it possible to determine two of the gases named at each stage of the combustion. Other gaseous mixtures may be similarly analyzed if the changes of volume on combustion are characteristic. For instance, benzene vapour likewise is burned at the first stage (270° C.), and may be very exactly estimated, because it produces six times its own volume of carbonic acid.

Description of the Apparatus.

The apparatus used by the authors for fractional combustion is shown in fig. 1. It consists of a Pettersson's burette A, with levelling vessel N, used in conjunction with a control tube C and a manometer B. The manometer is partly filled with water or petroleum, the position of which is read on a scale on the inclined limb. The two-way stop-cock I. of the burette A allows the manometer to be put in communication with the burette. The capillary connection *b c* leads to the three-way cock II., the plug of which has, however, only a single way. The connection *e* leads to a quartz tube D^1, packed with cupric oxide, and connected at its other end to the capillary *f g* with a three-way cock III. The connection from the latter leads to a two-way cock IV., by which it can be put in communication with either the mercury pipette Q or the potash pipette K. The potash pipette is packed with glass tubes, and its free space amounts to 120 c.c. The quartz tube is of transparent quartz, and is about 20 cm. in length, with an internal diameter of 7 mm., and with the walls 1 mm. thick. In the middle of its length the tube is packed for about 10 cm. with cupric oxide, and a quartz glass capillary is inserted from each end of the quartz tube as far as the cupric oxide, so as to avoid the latter being displaced, and to diminish the harmful free space. The cupric oxide must be fine, but not dust, and should be changed after fifteen to twenty analyses have been made, as it begins to lose its activity. All parts of the apparatus are connected with seamless thick-walled rubber tubing bound with wire. It was first attempted to heat the quartz tube to 270° C. by a closed air-bath. But the attainment of the desired temperature then took too long; and it was found better to use an oven in which the quartz tube was exposed directly to the combustion gases. This oven is made of quite thin sheet iron covered with asbestos, and has in its lower part two parallel tubes with several holes for luminous flames. The perforated plates *p* p^1 serve to distribute the heat of the rising gases, and a thermo-regulator allows of the correct temperature being maintained. The temperature in the oven remains practically constant everywhere in the same

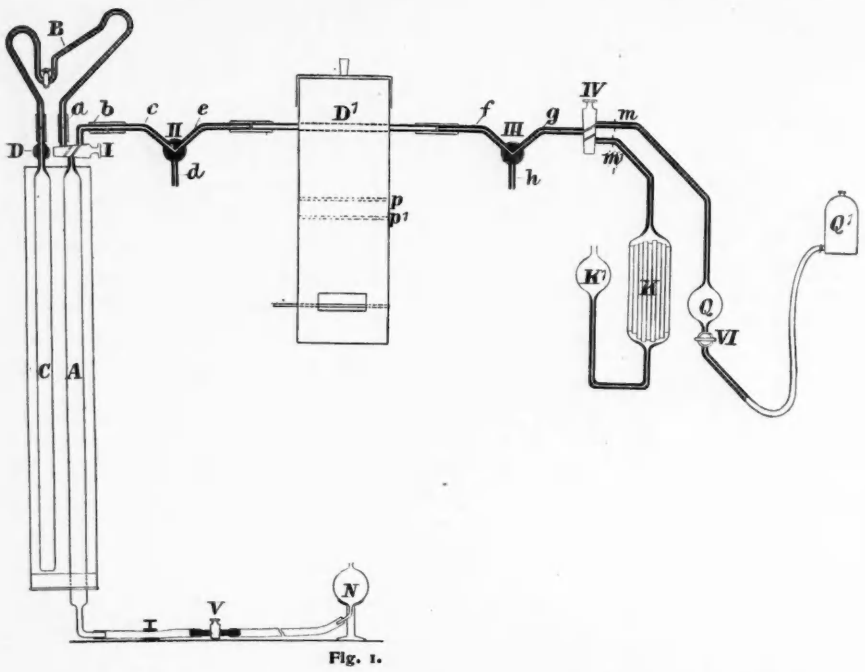


Fig. 1.

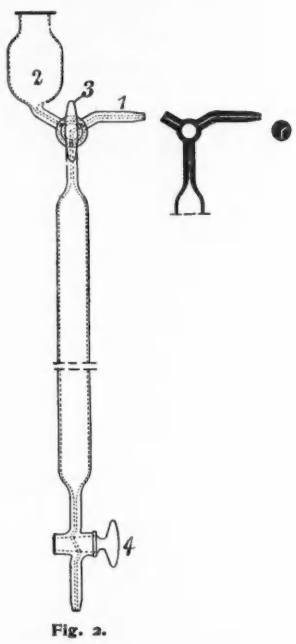


Fig. 2.

horizontal plane, and the thermometer bulb is placed alongside the quartz tube. The oven attains a constant temperature in ten minutes, and thereafter scarcely varies by one degree. Naturally the whole apparatus is tested for soundness, by filling it with gas under pressure and observing that the level of the mercury remains unchanged.

Method of Making an Analysis.

The potash pipette has to be charged with a solution of one part of potash in one of water, which may with advantage be coloured with a little fluorescein. The space between cocks II. and III. must be filled with nitrogen before each analysis. This nitrogen may be taken from a phosphorus pipette, or prepared in the apparatus itself after each analysis by drawing air through the cock II. into the pipette Q, and passing it to and fro over the reduced copper. This nitrogen is then shunted into the pipette Q, cock IV. closed, and air sucked in between cocks II. and III., and passed through the heated quartz tube till the copper is again completely oxidized.

The level of the potash in the pipette K is brought to the mark m^1, care being taken that it is not sucked beyond the mark into cock IV. and the capillary *g*, as the analysis would be vitiated. If the potash is thus accidentally drawn too far, a few drops of dilute sulphuric acid are sucked through the cock III. into the mercury pipette Q, from which it can be driven to and fro in the capillaries. If the acid is coloured with methyl orange, it is easy to see when it has become neutralized. Nitrogen is driven through cocks IV., III., and II., and out at *d* from the mercury pipette Q so that the quartz tube is filled with nitrogen, and mercury extends up to the mark *m*. The sample for analysis is transferred from a Bunte burette (as shown in fig. 2) by means of the arm 1 of the burette and the tubulure *d* of the apparatus. The cock II. is turned so as to give a free-way from *d* to *c*. By raising the levelling vessel of the burette, mercury is driven through I., *b*, *c*, II., and *d*, and the angle in the capillaries, to the funnel 2 of the Bunte burette to expel all the air in the connections. The lower end of the Bunte burette is attached to the water-levelling vessel, and by turning taps 3 and 4 of the burette to the right positions and raising the water levelling vessel and slowly lowering the mercury levelling vessel, the sample of gas is drawn into the burette A. The volume of gas enclosed in the burette is read, and the cocks I. and II. turned to open the way between A and *e*. The oven is then heated up; and when a temperature of 270° C. has been attained, it is brought into position about the quartz tube. In the subsequent manipulation of the gas, the cocks II. and III. must be left with the ways clear throughout the analysis, and the manipulation of levels, &c., effected by the cocks IV. and V. only. In order to pass the gas into the quartz tube, the levelling vessel N of the burette is raised, but not high enough for the mercury to reach the cock I.; cock V. is then opened wide enough for the

mercury to rise slowly in the burette; and cock IV. is opened to the pipette Q. As soon as the mercury reaches cock I., the levelling vessel N is lowered, and the rise of the mercury in Q is observed. When this mercury comes to the capillary, the levelling vessel N is again raised; and this procedure is repeated about six times. The rate of passage should be from ½ to 1 c.c. per second. After the last time, the level of the mercury in the capillary is brought exactly to the mark *m* by closing cock IV. at the right moment. The oven is then removed, and the capillary allowed to cool; and the decrease of volume corresponding to the amount of hydrogen in the gas is read off in the burette A after the pressure has been equalized. Carbonic acid which may have been formed is then absorbed by passing the gas in the same manner, but without heating, into the burette K. The procedure at the second stage of combustion at the higher temperature, in which an open flame is used for heating the quartz tube, is, in other respects, similar. It is best, in order to raise the temperature as high as possible, to place a fire-clay trough above the quartz tube.

Special Procedure for Coal Gas.

When it is required to determine carbonic acid, oxygen, heavy hydrocarbons, hydrogen, carbonic oxide, methane, ethane, and nitrogen, the analysis is started by the determination of carbonic acid by means of caustic potash, hydrocarbons by means of bromine, and oxygen by means of pyrogallol, in the Bunte burette or other usual apparatus. If care is taken to use only small quantities of the reagents, and as little water as need be in washing them out of the burette, the gases lost by solution in the water will be only small in quantity. The type of Bunte burette used for some time past at the Carlsruhe Institute has been the one shown in fig. 2, having the stop-cock 3 with only one way through it. This has proved better than the former types. The calibration of the burette should be made on the volume up to the lower end of the upper capillary, and not, as is often the case, to the tap, because in practice the capillary is filled with water in all the measurements of volume. Before transferring the residual gas from the Bunte burette to the burette A (fig. 1), it is best to let a little water, acidified with sulphuric acid, pass through the upper part of the Bunte burette, in order to prevent any solution of potash being carried over into the burette A. The gas is then passed into the burette A, and its volume measured after equalization of pressure in the manner already described. It is convenient to take the residual gas into the burette A to the level corresponding to the percentage of residual gas in the Bunte burette, so that the results obtained in the analysis of the residual gas become direct percentages of the original volume. The gas is passed over the cupric oxide heated to 270° C., whereby the hydrogen and the carbonic oxide are burned. The diminution in volume gives at once the proportion of hydrogen in the gas; while the volume of carbonic acid formed, which is ascertained by absorption in the potash pipette K, corresponds with the volume of carbonic oxide in the gas. The cupric oxide tube is then heated to a bright red-heat and the residual gas passed through it, whereby the methane and ethane are burned. The methane produces its own volume, and the ethane double its volume, of carbonic acid. The increase of volume by combustion therefore gives directly the volume of ethane in the gas. The carbonic acid formed is then absorbed in the potash pipette K, and the decrease corresponds with the carbonic acid formed from both the methane and ethane. The residual gas in the burette is nitrogen.

The nature of the hydrocarbons absorbed by bromine can also be ascertained by the cupric oxide method. After the complete analysis has been made, as already described, a portion of the sample of gas, after absorption of the carbonic acid and oxygen contained in it, is burned at a red-heat without previous removal of the hydrocarbons. From the volume of the absorption by bromine, on the one hand, and the excess of carbonic acid produced at the red-heat over that produced at the red-heat in the first analysis, the relative proportions of benzene and ethylene in the heavy hydrocarbons may be deduced.

A MODIFICATION OF THE FOREGOING APPARATUS.

The second paper is by Herr Hohensee, Chief of the Mining Laboratory at Saarbrücken, and describes a modification of the foregoing apparatus, the object of which is to effect the complete analysis without the aid of an independent Bunte burette or similar apparatus.

The burette, control tube, and measuring vessel are the same as in the apparatus already described. The burette is attached to a three-way tap B, fig. 3, which is connected with the quartz tube packed with cupric oxide. The absorption vessels and the mercury pipette K can be put in communication, in turn, with the cupric oxide tube by means of the special tap E, the barrel of which has a groove on one side of it, as shown. The upper position of the tap gives communication between the combustion tube and the oxygen absorption pipette L, which is charged with sticks of phosphorus. This absorption pipette is made open at the bottom for convenience of charging, and a cylindrical vessel is brought from below to envelop it with a water-seal. The horizontal position of the grooved tap puts the combustion tube in communication with the mercury pipette K, the levelling vessel Q^1 of which is fixed in any desired position by the arrangement shown in the figure. The downward position of the grooved tap puts the combustion tube in communication with the absorption vessels F and G, which are connected by a three-way cock J having a single hole through its plug. The absorption pipette F contains

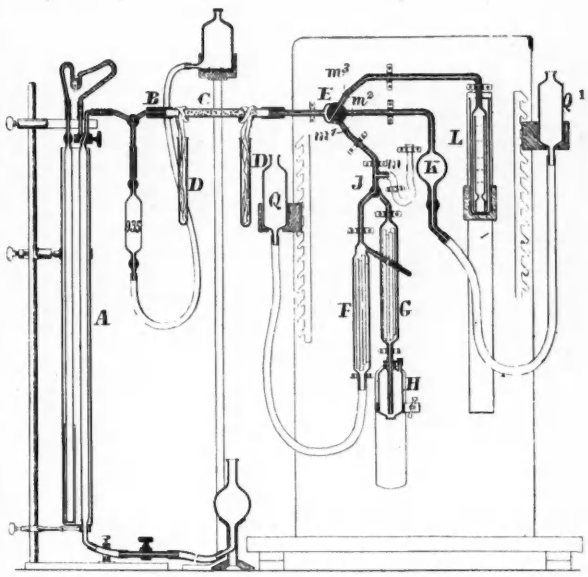


Fig. 3.

caustic potash standing over mercury, and the absorption pipette G is charged with fuming sulphuric acid, and is continued at the bottom in a tube which extends nearly to the bottom of a vessel H, which is connected with G by a ground joint. The vessel has a tubulure which can be closed by a ground stopper.

Method of Making the Analysis.

Before starting an analysis, the mercury vessels Q and Q^1 are filled with mercury, as is also the small reservoir provided for filling the capillary between the grooved tap and the three-way cock J. The screw clip *m* on this capillary is kept closed for the present. The potash pipette F is charged, by suction, through the tubulure provided by lowering the mercury vessel Q. The tubulure is closed with rubber tubing and a glass plug. The vessel H is filled with fuming sulphuric acid, L is charged with stick phosphorus, and the water necessary for sealing is put into the outer cylinder. This water is then drawn to the point m^3 and the mercury in K to m^2; while the potash and fuming sulphuric acid in F and G are brought to the level of about 1 cm. below the three-way tap J. The capillary between the three-way tap J and the grooved tap E is filled with mercury by opening the screw clip *m*. By these means, useless spaces in this part of the apparatus are avoided. What spaces there are, are so small that they do not come into account even in exact analyses. The quartz tube and the rest of the connections are filled with nitrogen, by sucking in air through B and freeing it from oxygen in the phosphorus pipette. The nitrogen is drawn back until the sealing water in L reaches the point m^3, and the connections between the grooved tap E and the burette then remain full of nitrogen, the excess of which is expelled through the tap B.

The tap B is used for the admission of the sample. The sampling vessel is marked 935 in fig. 3, and the spaces between B and the sampling vessel may be disposed of in either of two ways —viz., either by expelling the contained air by a portion of the sample through a tubulure on B [not shown in the drawing], or by filling the connections with mercury by means of a finely drawn-out pipette. The sample is then drawn over into the burette, and measured when the pressure reading of the manometer is zero.

On starting the analysis, the sample is put under small pressure in the burette, the grooved tap is opened downwards, and the mercury in the connection is driven into the small reservoir by careful opening of the screw clip *m*. The tap J is then turned to give communication with the potash pipette into which the gas is passed. After complete absorption of the carbonic acid, the potash solution is drawn back nearly to the three-way tap J, which is then closed, the capillary is again filled with mercury by careful opening of the screw clip *m*, the grooved tap is closed, and the difference of volume is read after the manometer has been brought to the zero mark. The procedure is similar for the absorption of hydrocarbons in the fuming sulphuric acid; but the acid vapours derived from the latter must be absorbed by passing the gas into the potash pipette before the reading of volume is made. This absorption should be made a second time in order to ascertain that it is complete. The gas is then passed into the phosphorus pipette, and the diminution of volume measured. The absorption also is repeated. The determinations of carbonic oxide, hydrogen, methane, and ethane are then carried out in the manner described in the first paper.

The advantages claimed for the apparatus are the avoidance of free spaces, in which other gases are enclosed, and the avoidance as far as possible of rubber connections. It is only necessary to disconnect the apparatus for the renewal of the cupric oxide after fifteen to twenty analyses have been made. The rubber connections to the quartz tube should be of best thick-walled seamless

tubing. The use of non-transparent quartz tube is undesirable, because it frequently develops capillary cracks after being used once or twice, and thus becomes permeable to gas. It is of course easy, if desired, to have another pipette, for the direct absorption of hydrogen by colloidal palladium, attached to the grooved tap; while absorption pipettes for other purposes could be connected below the tap B if required. If there are no heavy hydrocarbons in the gas which has to be analyzed, a simple Hempel pipette for the absorption of carbonic acid can be used instead of the two absorption vessels F and G. If ethane has not to be determined independently of methane, the gas may be passed directly from the red-hot cupric oxide into the potash pipette, as experience has shown that the combustion of the last trace of methane takes place more readily in the absence of carbonic acid.

The apparatus described has been in use for about a year and a half, and has given great satisfaction, especially in the analysis of mine gases—from blows in particular.

[The chief novelty of the foregoing apparatus consists in the use of cupric oxide for the fractional combustion of hydrogen, carbonic oxide, methane, and ethane. The control tube is similar to that adopted by Dr. J. S. Haldane in his apparatus for the analysis of mine air, but he has given up the troublesome independent Pettersson's manometer adopted by the authors, and uses a potash pipette with an additional limb as the manometer. This simplification of the apparatus might readily be applied to the authors' design, or, alternatively, the cupric oxide combustion tube might be used in existing forms of Haldane's apparatus in place of the platinum spiral provided in them. The grooved tap used by Herr Hohensee is novel, and might similarly be used to connect the pipettes of Haldane's apparatus; the forms of absorption pipette used in the latter are in many respects more convenient than those described by the authors.—Ed. J.G.L.]

A SEMI-CONCRETE CONDENSER-HOUSE.

In view of the increased use of reinforced concrete in the construction of buildings on gas-works, the following paper, prepared for the Michigan Gas Association by Mr. E. F. Floyd, of Adrian (Mich.), may possess some features of interest.

The Adrian Gas Company undertook in 1908 the complete rebuilding of their manufacturing plant, including the construction of a condensing and scrubbing installation with the building to contain it. The subsoil being of rather doubtful quality, and the question of economy being a desideratum, it was decided to put up a building that would accommodate itself to some possible subsidence of the ground, that would be cheap to construct, sufficiently fireproof not to require insurance, and while not decorative, yet be of a generally pleasing character.

A foundation wall was first built of concrete, about 12 inches thick, made in the usual manner by constructing a matrix and filling it in. This was not reinforced. On the top of the wall, and before it had set, was embedded a 2-inch by 4-inch scantling, laid flat, and set back 1 inch from the proposed face of the wall above. On this light sill were erected 2-inch by 6-inch studs of the required height, some of them being in a single piece, others, in the higher part of the building, in two lengths spliced. These were connected together at the top with a 2-inch by 4-inch plate, similar to the sill below; and 2-inch by 6-inch rough sills and heads were inserted for windows, &c. This constituted all the wood in the framework of the building.

To stiffen this framework suitable holes were drilled in the studs with "seconds" fence wire run through these holes in the studs in a generally diagonal manner. These wires were then twisted tight, forming substantially a basket construction having extreme rigidity and lightness. Thereafter, forms were made in the shape of ordinary matched pine flooring, put up in the manner of doors, long enough to span about three spaces and about 30 inches high. These were conveniently fastened to both sides of the studs, and ordinary three-quarter stone concrete was filled in between them; being spaded down against the forms to bring the fine material to the surface of the walls. As the concrete set sufficiently to hold itself in place, the forms were removed and placed elsewhere.

The method of forming pilasters on the exterior face was accomplished in a simple manner. The various forms were held in place, either by nailing to the studs or by passing wires through the forms and tightening them to hold the latter to the studs. These wires were afterwards snipped off at the wall surface. The work thus continued until the plate at the top of the studs was embedded in concrete. As the work progressed, the requisite channel posts for the mezzanine floor and roof were placed. The roof and the mezzanine floor were constructed by laying trussit metal transversely on the steel channel joists, after which concrete mortar, made of sand and cement only, was spread over the top of the metal; the latter being sufficiently stiff to carry the workmen. After the mortar applied to the upper side of the metal had partially set, a plaster coating of it was applied below. When the whole structure had completely set, a parapet wall of common brick, merely for ornament, was put up around the entire building—coped with ordinary 12-inch vitrified coping tile.

Frost intervened during the construction of the works, and the high portion was not completed as to concrete until the following spring. Meantime, the roof over the lower portion went through the winter successfully. During the next summer, a hot day was selected, following a dry period, when coal tar was swabbed over the cement forming the roof. This had sufficed to keep the building water-tight. After the walls were complete and had thoroughly dried, and the windows, &c., placed, the outside faces of the 2-inch by 6-inch studs, which, of course, are flush with the face of the concrete, were covered with vertical 3-inch by 1-inch cypress strips, chamfered, and finished in natural oil.

Unfortunately, owing to the long delay in the construction of the building, the cost figures upon the work are not sufficiently accurate to be quoted with confidence; but it will be obvious that it is an economical construction, and in durability will doubtless outlast its usefulness otherwise. As to its fireproof qualities, it is well-known that a joist of wood embedded in masonry will burn but very slowly, principally charring on the exposed surface.

CORRESPONDENCE.

[*We are not responsible for opinions expressed by Correspondents.*]

High-Pressure Gas Distribution.

Sir,—In answer to the query regarding pressure, raised in your editorial comments upon my supplementary paper read before the North of England Association at their last meeting, I may state that the pressure at which the gas was tested, both before and after compression, was 4 inches water-gauge; and the gas consumed during all the tests at the distant station had been compressed to a pressure of 16 lbs. per square inch.

In regard to my reply to the discussion, there appears to have been some misinterpretation, at the latter end relating to the final tests; and I now beg to correct same. After the defective syphon tube and plug were replaced, the main was further tested to 15 lbs. pressure; and at the end of four hours there was not the least drop in the pressure recorded on the gauge.

F. C. Willis.

North Shields, Oct. 14, 1911.

Sir,—In the discussion upon the paper by Mr. F. C. Willis, read at the meeting of the North of England Gas Managers' Association on Saturday last, I am reported to have said that, by the Cox formula, the carrying power of the mains is "according to the square root of the difference between the high initial pressure and the terminal pressure." This should read "according to the square root of the difference between the squares of the high initial pressure and the terminal pressure."

May I point out that, in transmitting per hour 12,600 cubic feet of gas (·4 sp. gr.) through 1870 yards of 4-inch main and then through 4000 yards of 3-inch main, the initial pressure of 18 lbs. per square inch would be reduced to 17·1 lbs. in the former main, and a further reduction to 7·2 lbs. would occur in the latter main.

The reductions in pressure found by Mr. Willis in actual working are generally less than those obtained by the formula mentioned; but in some instances they are closely approximate.

A. Clement Hovey.

82, *Norfolk Road, Sheffield, Oct.* 12, 1911.

Position of the Dessau Vertical Retort.

Sir,—The series of articles published in the "Journal" and concluding in the Sept. 19 issue, doubtless appeals to, and has been read by, many engineers who are "sitting on the fence." There will be general inquiries for further information; but while this may be anticipated, there is also the man who wishes to know the exact *pros* and *cons* in the comparisons of the two systems, intermittent and continuous.

Now, from Table VI., it is shown that the best net corrected valuation figures are:

Glover-West	8,249,500	per ton of ash free coal
Dessau	8,956,810	,, ,, ,,

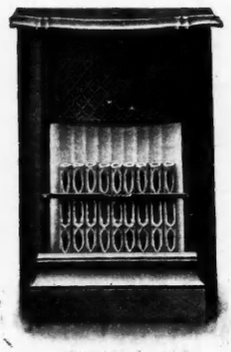
or a difference of 8 per cent. to the advantage of the intermittent. No information is given as to the price (fuel consumption) exacted for this higher figure. It would be interesting to have some further comparisons on this point, as the impression given at this year's Institution meeting was that, in comparing Manchester with Sunderland, the advantage was with the former in fuel consumption, as well as in wages per ton of coal carbonized. Granted that in the more modern Dessau settings the wages now at least compare favourably with the Glover-West, there still remains the question of fuel consumptions, which were in round figures as 1 to 3 lbs.

Again, before leaving the question of coke, there was a strong claim by the Glover-West supporters for a superior coke, eminently suitable for domestic purposes. Can the Dessau make an equal claim?

Undoubtedly the hygienic working conditions are favourable in both cases; but, while this is a strong humanitarian point, there is the other side, that the cost of either system of verticals pans out at least double the cost of horizontals per ton of coal on large retort-houses, and more so for small installations. And whatever may be the attraction, it is at present difficult to justify the extra expenditure unless the comparison is against old settings. Otherwise, with modern horizontals and machinery, there is a big gap to fill up, especially with high yields such as one hears about at Cheltenham.

R. W. E.

Oct. 14, 1911.



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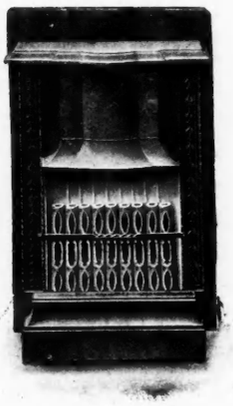

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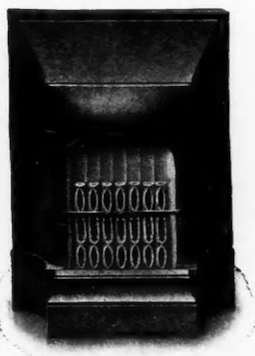

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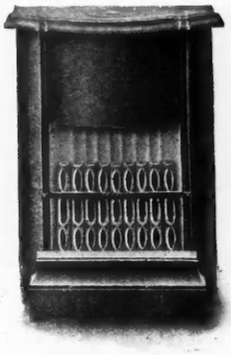

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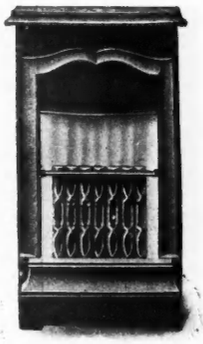

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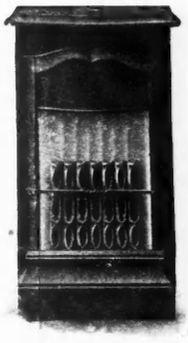

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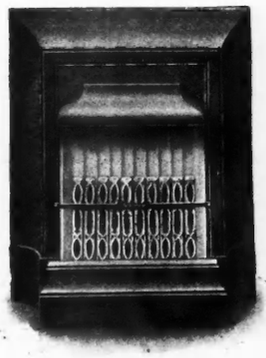

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LAUSANNE. The plant erected for the Municipality fulfilled all guarantees in the first month's working; has MADE THE WHOLE OF THE GAS FOR THE TOWN since January.

The make of gas has averaged 12,676 cubic feet per ton; 617 B.T.U's gross; 13.2 per cent. Fuel, since the first day of working to present day; and over a period of seven weeks, May 1st—June 9th, the results have averaged 13,174 cubic feet per ton; 591 B.T.U's gross; 13.1 per cent. Fuel.

The plant has received the highest praise from distinguished Continental Experts.

REGISTER OF PATENTS.

Recovering Bye-Products from Distillation Gases.

MUELLER, W., of Essen-Ruhr, Germany.

No. 21,210; Sept. 12, 1910.

This invention relates to the recovery of oil tar and benzol and ammonium sulphate from hot distillation gases, of the kind wherein the oil tar or benzol or the like is first removed in a washing apparatus, which works at such a temperature that the gases leaving the apparatus may be passed direct into a saturator for the recovery of ammonia and "the whole process carried out without condensation of water vapour from the gases." The tar and oils are extracted by passing them through a single chamber containing numerous grids or hurdles; the tar being separated by the repeated dashing or impact of the gases upon surfaces specially arranged in the chamber for the purpose. That is, the tar is separated by shock instead of (as in prior processes) by washing as usual, and the then scrubbed gases (which are not allowed to cool to such a temperature that the water vapour contained in the gas would be condensed) are then passed direct into the sulphuric acid bath of a saturator, in which the ammonia is recovered in the form of sulphate, and the gases through the ammonia saturator "under such conditions as to prevent condensation of water vapour from the gases in the saturator."

Fig. 1 is a diagrammatic view of the apparatus for treating the gases. Fig. 2 shows in sectional elevation the apparatus for cooling and scrubbing the hot gases for the purpose of removing the tar. Figs. 3, 4, and 5 illustrate various constructions of the grids or hurdles used in the apparatus.

The apparatus for cooling and scrubbing the gas shown in fig. 2 consists of an outer chamber for the preliminary cooling, and an inner chamber used as a scrubber. The latter is filled with hurdles or grids of the construction shown in figs. 3, 4, and 5, through which the gas washing liquor descends and the gases ascend. Near the top are vertical and horizontal sieves A, through which the escaping gases have to pass, and which retain the last traces of water contained in the gases. Spraying nozzles B, arranged near the top, serve for sprinkling the inner and outer chambers with gas-water, oil, or other suitable washing liquor. Near the bottom of the inner chamber is a propeller or fan C, driven by a motor, which serves to force the gases upwards and increases their pressure within the apparatus.

The gases are introduced through two pipes, one of which (D) opens into the top part of the outer chamber, while the other (E) delivers the gas into the middle of the inner chamber by means of an annular distribution socket surrounding the inner chamber. The provision of two gas inlets is to obviate any thickening of the tar which might lead to choking or stoppages of the lower part of the scrubber.

The grids or hurdles shown in fig. 3 consist of narrow, thin laths or boards of different heights, so arranged that the contour of each group of boards has the form of a cross; each horizontal row being staggered in relation to the neighbouring row, so that the gases have to take a zig-zag course. The "step-wise arrangement of the hurdles produces a repeated impact of the gases and the washing liquor; the gases striking against the lower horizontal surface of the grids and splitting into a large number of thin streams, which intimately intermingle with the washing liquor trickling through the grids."

The hurdles in fig. 4 consist of bars of triangular section the inclined sides of which are corrugated so as to form steps. The bars are placed between intermediate thin laths or spacing bars in such a manner as to break-joints with neighbouring rows. As shown by the arrows, the gases are divided by repeated dash or impact against the lower solid faces of the bars into a great number of thin streams, while the washing liquor is "continuously diverted by the corrugations of the inclined surfaces and uniformly sprinkles the hurdles."

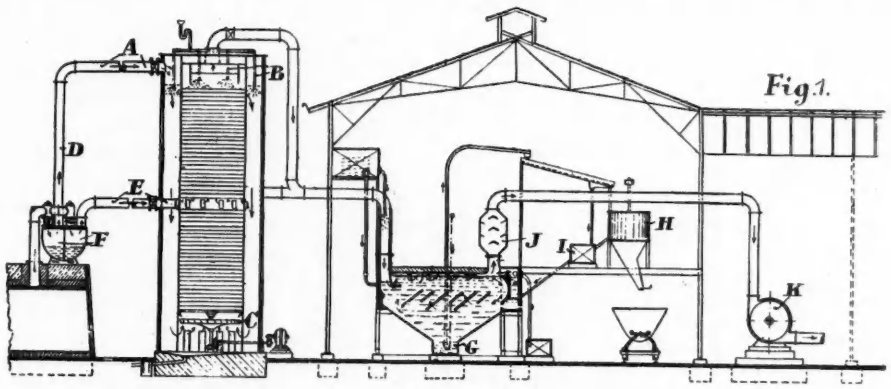


Fig. 1.

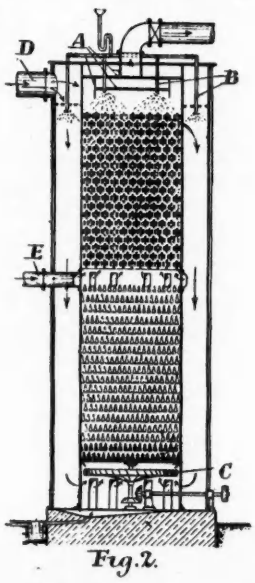


Fig. 2.

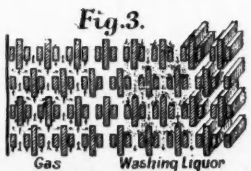


Fig. 3.

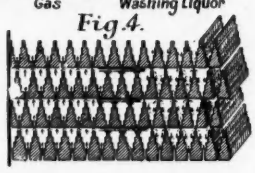


Fig. 4.

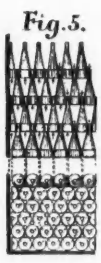


Fig. 5.

Mueller's Gas-Washing and Sulphate of Ammonia Plant.

In fig. 5, the elements consist of cones which are inserted with their base portions between the apices of the cones immediately below. If required, the elements may be provided with conical extensions at the bottom, so as to form double cones. These elements are said to have the advantage that the effective washing surface per available unit of volume is increased by more than 50 per cent.; the gases being divided up into a number of thin streams in the same manner as by the constructions shown in figs. 3 and 4. As indicated by the arrows, the gases strike against the horizontal faces of the cones moistened by the washing liquor.

The above apparatus is directly connected with an ammonia saturator of rectangular oblong section, and provided with a conical bottom and a flat top. This part of the plant is the subject of a separate patent—No. 15,034 of 1911—to be described later on.

The method of treating the gases is the following: In order to remove the tar and ammonia in a "direct" manner, it is essential first to separate all the impurities from the hot gases, so that during the following passages of the gases through the sulphuric acid bath in the saturator the ammoniacal salts should not be polluted by tarry substances. To attain this, the hot gases, being somewhat cooled in the collecting mains F, are introduced at a temperature of about 200° to 250° C. into the scrubber. During their passage through the outer chamber, the gases cool down to a temperature of about 100° C.; and the major part of the tar and other impurities is separated. To prevent the formation of tar deposits on the sides of the scrubber, it may be sprinkled from the top by the spray nozzles B; and in order to remove even the smallest particles of impurities, the gases are then passed through the scrubber containing hurdles or grids shown in figs. 3, 4, and 5, in this way being repeatedly split up into numerous fine streams and "uniformly divided in the whole space of the scrubber." Owing to the increased velocity imparted to the gases by the fan C, the gases are caused to dash a great number of times against the horizontal surfaces of the grids, whereby all the solid and liquid substances are separated. The products thus obtained collect in the bottom part of the scrubber, from which they automatically run through a syphon-pipe to a tank, wherein separation, according to specific gravity, takes place. The recovered gas water and (if required) the light thin tar, may advantageously be used again as washing liquid, introduced through the spraying nozzles. The excess, which cannot be used for washing and contains only solid combinations of ammonia, is supplied without any further treatment to the acid bath of the saturator.

When treating coal which produces gases very rich in tar, it is preferred to collect the gases in two fractions, corresponding to the first three-quarters and the last quarter of the period of distillation; separate mains being used for the two fractions. This manner of collecting the gases is not in itself new, the patentee remarks; but while it has hitherto been usual to wash the two fractions separately,

or not to wash the gas of the latter period at all, the present arrangement enables both kinds of gases to be scrubbed simultaneously. For this purpose, the gas obtained during the first part of the distillation is introduced at the top through the pipe D, so that it has to pass through the whole of the apparatus in the manner described. The gas produced during the last quarter of the distillation is then introduced through the pipe E in the middle of the apparatus, where it mixes with the gases produced earlier during the distillation, and is subjected to the scrubbing action together with the latter gases. As is known, the gases of the last period are much hotter than those rich in tar produced during the first period, and often cause "incrassation" of the tar in the apparatus, if the gases of both periods are treated simultaneously. "This drawback is, however, obviated if the gases enter the apparatus separately, and are mixed only after the gases of the first period are more than half washed or scrubbed. By introducing the hot gases of the second period into only the upper portion of the scrubber, it is also attained that the hot gas water or thin tar used as washing liquor is still more heated, whereby the ammoniacal constituents in the gas water are vaporized and caused to escape together with the gas."

The solid salt of ammonia produced in the saturator (to be described later on) by the reaction of the ammonia upon the sulphuric acid drops into the collecting chamber G, which communicates with a lateral shaft, and is lifted by means of a steam driven ejector to a draining table, whence it is delivered to the centrifugal drying machine H, which leaves the salt in a saleable condition ready to be stored away. The separated mother liquor runs into a liquor pot I, which automatically returns the liquor to the bath in the saturator for further treatment. The gases which are entirely purified from tar and ammonia are finally drawn from the saturator through an acid separator J by means of the exhauster K, which forces them into a gasholder, in which they are stored to be used for illuminating, heating, or motive power purposes, or otherwise disposed of as desired.

Combined Gas and Water Taps for Geysers.

BARRALET, T. E., and the PARKINSON STOVE COMPANY, LIMITED, of Birmingham.

No. 23,000; Oct. 5, 1910.

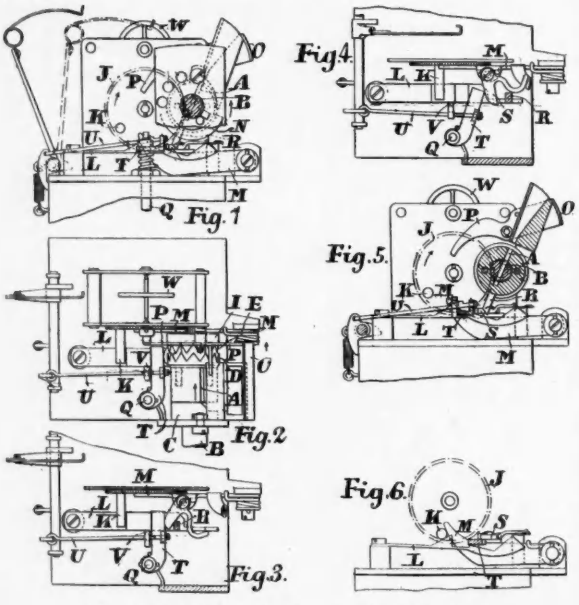
The principal object of this invention is to provide a combination appliance by which both the gas and water taps of a geyser are carried on the same spindle, and arranged so that the temperature of the water can be varied (as required) simply by turning the single operating handle—the water being preferably admitted in advance of the gas-tap being opened. The two taps are rigidly connected, so as to turn together; and it is arranged that the first portion of the opening movement gives a full gas supply but only a small water supply, whereas by the further operation of the cock the water supply is increased or turned on full without interfering with the full gas supply.

Coin-Controlled Gas Supply Mechanism.

GLOVER, A. W., and GEORGE GLOVER and Co., LIMITED, of King's Road, Chelsea.

No. 25,172; Oct. 29, 1910.

This coin-controlled mechanism is of the type which supplies gas for a given time and then stops further supply. For this purpose, there is an arm on the winding handle arranged to move the lever controlling the supply into engagement with a detent, formed with a tail-piece arranged in the path of the arm, whereby the detent can be withdrawn from the lever when it is required to stop the supply independently of the operation of the clock mechanism.



Glover's Coin-Controlled Gas-Supply Mechanism.

Fig. 1 is a front view of the mechanism. Fig. 2 is a plan. Fig. 3 is a detail showing parts of the mechanism in the positions they occupy when a valve controlled by it is in position to allow a supply of gas to pass. Fig. 4 is a corresponding view showing the position the parts occupy after they have moved the valve to cut off the supply. Fig. 5 is a front view.

To operate the mechanism, after a coin has been inserted in the slot A, the spindle B is first rotated in the direction of the arrow. When the edge of the coin in the slot is moved along the sloping face of the guide-plate C, the coin is moved so that the clutch parts D E are put into engagement. At first the member E and its hub alone are moved by the member D against the pull of the spring F, so as to ensure proper engagement of the clutch members and to prevent jambing of the parts as they move into engagement. The lugs G then reach the ends of the recesses H, and thereafter the flanged member I is rotated with the spindle, whereby the main spring of the clock mechanism is wound up and the wheel J is rotated so as to carry the pin K away from the arms L M. Rotation of the spindle is arrested by a stop coming against the opposite side of a fixed stop to that on which it is shown in fig. 1; and the coin, having then been brought past the guide-plate N, falls into the money-till. A number of coins may be in like manner successively inserted until the lever O is moved by the pin and carries the plate P into a position covering the mouth of the coin-conduit.

When it is desired to make use of the gas the supply of which is controlled by the spindle Q, the spindle B is turned in a direction contrary to that indicated by the arrow, so that the arm R, acting through the lever S, moves the lever T to the position shown in figs. 1, 2, 3, and 5, in which position it is retained by a notch or detent in the spring arm L to permit the supply to continue after the spindle B is released. At the same time, a shoulder on the connecting rod U is moved until it is brought opposite the notch in the lug V, whereupon the rod U is set free and the arm is moved suddenly by a spring and draws the brake finger over the rim of the balance-wheel W from the position indicated in broken lines in fig. 1 to the position shown in full lines—this movement ensuring the starting of the clock.

By turning the spindle B in a direction from the position shown in fig. 1, the arm R is brought into engagement with a tail-piece, and depresses a spring arm so that the lever T is released from the notch shown, and is moved suddenly into the position shown in fig. 4, while the connecting rod simultaneously moves the brake finger into contact with the balance-wheel W, and stops the clock.

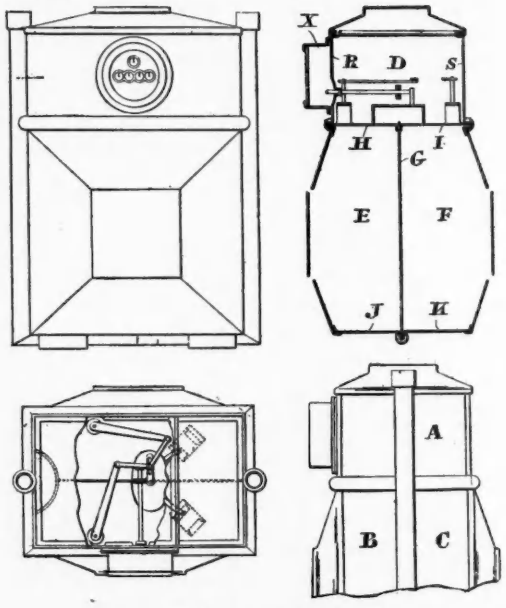
When the clock mechanism has nearly run down, the pin K depresses the spring arm L and moves it away from the lever T. This would not prevent the lever being held indefinitely above the notch by means of the spindle B acting through the arm R. It is in order to meet this objection that the intermediate lever S is provided. This lever, when the clock mechanism is run down, is raised, by the engagement of the pin K and arm M, above the plane in which the lever T moves (fig. 6), so that there can be no operative connection between the arm R and lever T until the pin is moved and allows the arm M to fall.

Dry Gas-Meters.

BENNET, J. H., of Edinburgh.

No. 25,943; Nov. 8, 1910.

This invention has for its object to provide a meter casing which, while preserving the general features of meters used in ordinary service, shall, by its special method of assembly and jointing, be suitable for use on high-pressure systems.



Bennet's High-Pressure Dry Gas-Meter.

The meter is made with ends or gables, front and back, top and bottom, as follows: The gables are divided into three parts, A, B, C. A covers the valve-chamber D, and B and C cover the bellows compartments E F, which are separated by a division G. To the top of the division, and slightly below this, there are soldered two plates H I, which together form the valve-plate; and to the bottom of the division there are soldered two plates J K, forming the bottom of the meter. The front and back of the meter are placed in position in a manner somewhat similar to that in which a tin lid is applied to a tin, and soldered there at the bottom by means of joints formed at a suitable angle, and at the top to the valve-plate by joints, including a plate entering a V groove formed in a reflex roll—the valve-plate being so formed at the edges as to permit this. The parts B C of the gables

are then soldered in position, and gables of the same kind are applied to each side or end of the compartments E F.

The head of the meter is formed as a valve-chamber D by the front and back galleries R S and the top gables at each end being connected together.

The valve mechanism (of more or less conventional type) is illustrated for the purpose of explaining that as in this meter the gas fills the whole of the meter, including the compartments D, E, F, and X, the stuffing-boxes used need only be lightly stuffed, whereby accuracy of measurement can be obtained, because the friction on the moving parts is small. Because the pressure at both sides of the stuffing is substantially the same, and the gas on each side is the same, then because of the leak through the stuffing-boxes, after the gas has obtained a state of equilibrium, practically no further diffusion nor interchange of gas from one part to the other will take place. This, however, does not strictly apply to the index-box, because it is found that the main gas pressure is not transmitted through the stuffing there, but is considerably reduced before it reaches the box. Therefore, although a construction of the kind described would resist the whole gas pressure, a considerable factor of safety is introduced by this stuffing-box.

The bellows mechanism has not been indicated, as any suitable mechanism may be added. Further, the usual fittings may also be attached by any desired method.

Recovery of Ammonium Sulphate from Distillation Gases.

MUELLER, W., of Essen-Ruhr, Germany.

No. 15,034; June 27, 1911. Ante-dated, Sept. 12, 1910.

This invention relates to the recovery of ammonium sulphate from gases in such plant as that described in patent No. 21,210 of 1910.

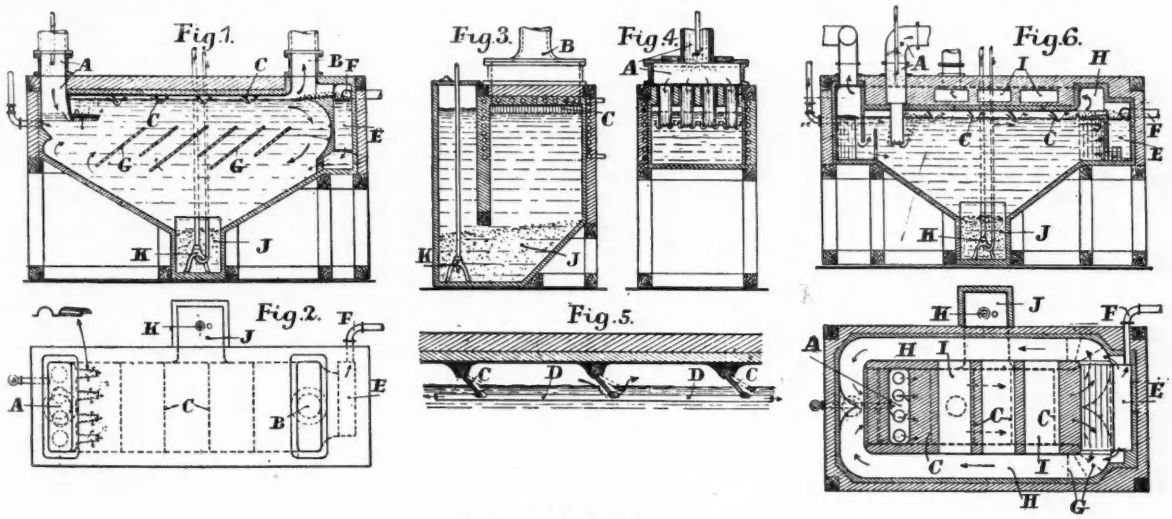
The distillation gases in their passage through the saturator "cause the acid liquor therein to circulate, and consequently to present a continuously changing liquor or/and surface to the incoming gases, and furthermore the impurities which collect on the surface of the acid liquor forming the acid bath are automatically removed in a continuous manner, and thereby the surface of the bath presented to the incoming gases is always kept in a clean condition, so that the incoming gases always meet clean acid liquor."

Fig. 1 shows, in sectional elevation, a saturator used for freeing the gases—coming from (say) washing and cooling apparatus such as is described in patent No. 21,210 of 1910—from ammonium, and recovering the latter in the form of sulphate. Fig. 2 is a plan, and figs. 3 and 4 transverse-sections. Fig. 5 shows baffle-plates—or means for immersing the gases at several points—pivotally mounted in the top of the saturator chamber. Fig. 6 (similar to figs. 1 and 2) illustrates another construction of the apparatus, with a horizontal sectional view.

The gases pass into the saturator shown, which is of oblong section, and provided with a conical bottom and flat top. The gas enters through an inlet pipe A, which is widened at its lower end and is provided with a number of distribution hoods (of smaller diameter) dipping into the liquor. The purified gases ultimately leave through the pipe B. Unlike other saturators, provided with a bell-shaped cover, the present apparatus has a flat or straight top, which lies between the inlet and exit pipes, and is provided with a number of baffle-plates C dipping into the bath, and preferably inclined in the direction of the movement of the gases. The plates may be corrugated and provided with serrated edges. To enable the immersion of the plates to be regulated as desired, they are pivotally mounted on to the top, and connected by a guide-rod D, adapted to be adjustable from the outside. At the end of the saturator chamber there is a froth-chamber E, having at the inner side (towards the bath) a concave surface for diverting the liquid in a downward direction, and sieves through which the overflowing mother liquor returns to the bath. The tar-froth and other impurities, as they accumulate, run off by a pipe F into a collecting tank below. In the middle zone of the saturator are several perforated baffle-plates G, to retain the salts, which might otherwise be carried round by the current produced in the bath.

For gas which contains a high percentage of ammonia constituents, the saturator may be constructed as shown in fig. 6, so as "to utilize to higher degree the heat produced by the reaction of ammonia upon sulphuric acid." For this purpose, the gas, after passing the last baffle-plate C, is not discharged directly outward, but is led through lateral flues or channels H, which communicate through transverse passages I, so that the gases, before leaving the apparatus, have to remain for some time in the spaces surrounding the sides and the upper part of the saturating chamber proper, and give up part of their heat to the liquor of the bath.

The method of treating the gases in the apparatus is the following: In order to remove the bye-products, more especially the ammonia, in a "direct" manner, it is essential first to separate the tar and other impurities from the hot gases, so that during the following passage of



Mueller's Sulphate Saturators.

the gases through the sulphuric acid bath in the saturator the ammoniacal salts should not be polluted by tarry substances and rendered unsaleable. To attain this the hot gases are freed from tar—for example, in apparatus (not shown) such as described in the 1910 patent. The hot gases, still charged with the ammonia combinations, are passed from the washer, through the pipe A, direct into the sulphuric acid bath of the saturator. They enter the bath through the widened end of the pipe with its distribution hoods (or else through a number of smaller pipes), bubble through a certain height of the bath up to the top of the saturator, and then move in a thin and wide stream over the surface of the bath to the exit. Since the ammonia is not completely absorbed during the first passage through the acid, the gas is compelled to pass repeatedly through the acid by the baffle-plates C, which dip into the bath and are inclined in the direction of the gas current. The result of this arrangement is that, on the one hand, all the ammonia contained in the gas is completely absorbed, and, on the other hand, the upper zone of the bath is given a continuous forward movement. On account of the latter, all the impurities collecting on the surface (tar-froth and the like) are carried towards the end of the bath and caused to pass into the froth-chamber E, from which they run outwards into a tank (not shown) through the pipe F. The mother liquor carried together with the froth into the chamber E returns to the bath through the sieves at the bottom. In this way, the surface of the bath is always kept in a clean condition; so that the fresh gases entering always dip into clean acid liquor. The concave inner surface of the side of the chamber E directs the flow of the liquid back, either in the downward direction as in fig. 1 or in the lateral direction as in fig. 6. Owing to this circulation, the upper zone of the acid bath is thoroughly stirred and the efficiency is increased, while the consumption of acid is reduced to a minimum."

The solid salt of ammonia produced in the saturator by the reaction of the ammonia upon the sulphuric acid drops into the collecting chamber J, which communicates with a lateral shaft, and is lifted by a steam-driven ejector K to a draining table, whence it is delivered to a centrifugal drying machine, which leaves the salt in a saleable condition ready to be stored away. The separated mother liquor runs into a liquor-pot and automatically returns to the saturator for further treatment.

The invention "renders it possible not only to obtain a complete absorption of all the ammonia from the gas without any employment of the usual so-called after separator, but also a clean, white salt of ammonia is obtained, while the consumption of acid is reduced to practically the minimum."

Fylde Water Board's Next Bill.—At a recent meeting of the Fylde Water Board, the situation in reference to all new works and pipe-lines authorized and otherwise, was discussed. As the result, it was resolved: "That a Bill be promoted in the ensuing session of Parliament for the acquisition of further water rights and the construction of works and trunk mains in connection therewith; also for further borrowing powers to complete the Grizedale Lea reservoir." The minutes of the General Purposes Committee recorded that a geological report from Professor Tiddeman on sites for reservoirs in the Upper Hodder Valley was read, and it was resolved that the Engineer should proceed with the trial holes and borings in that valley. At a subsequent meeting of the Committee, a letter was read from the Town Clerk of Blackburn in reference to the Board seeking a supply of water in the valley of the Hodder. There was also submitted a report from Dr. Mill, Director of the British Rainfall Organization, on the rainfall of certain areas in the Forest of Bowland and other districts.

LEGAL INTELLIGENCE.

JOHANNESBURG GAS PLANT CONTRACT LITIGATION.

Municipality Awarded £340,000 Damages.

Under the "Legal Intelligence" heading in the "JOURNAL" for the 13th of June, it was mentioned that the hearing of evidence had commenced in the Court of Session, before Lord Ormidale, in an action brought by the Municipal Council of Johannesburg against Messrs. D. Stewart and Co. (1902), Limited, of Glasgow, and Mr. William Beardmore, shipbuilder and steel manufacturer, and others, for sums amounting to upwards of £400,000, in respect of the firm named having abandoned and failed to implement contracts entered into by them with the Municipality for the installation of gas-producing plant, gas-engines, and electrical plant for tramway, lighting, and power purposes. Messrs. Stewart and Co. denied the breach of contract, and stated that the installation was made according to the specification, and that any failure of the installation to reach the prescribed tests was due to the unsuitability of the coal supplied to them for gas-producing purposes. Mr. Beardmore was guarantor for the performance of the contract by Messrs. Stewart and Co.; and his liability was limited to the amount contained in a bond—viz., £115,134. The balance of the sum sued for was £145,000 for repayment of the part of the purchase price paid to Messrs. Stewart and Co., and about £200,000 for damages for breach of contract. At the close of the evidence, judgment was reserved; and this was given last Tuesday.

His Lordship found in terms of the declaratory conclusions of the summons, and decerned against Messrs. D. Stewart and Co. and Mr. Beardmore jointly and severally for payment to the Municipality of £115,134, with interest at the rate of 4 per cent. per annum from July 1, 1909, till payment; reserving to Mr. Beardmore such right of relief against the defendant firm as might be competent to him. Further, his Lordship decerned against Messrs. Stewart and Co. for payment to the Municipality of, first, £27,961, with interest at the rate of 4 per cent. per annum from July 1, 1909, till payment; second, the sum of £127,907; and, third, the sum of £69,175, with interest on these two sums at the rate of 5 per cent. per annum till payment. His Lordship found the defenders other than Mr. Beardmore liable jointly and severally to the pursuers in expenses.

In the course of a long judgment, his Lordship dealt with the history of the case; narrating the several contracts with which the action was connected, the correspondence which ensued, and the steps which followed in regard to the partial undertaking of the contracts and their ultimate abandonment. In the specification on which these were based, section A was for gas-producing plant and accessories; section B for gas-engines; and sections C, D, and E for electrical generating machinery—for C two-phase alternators, for D direct-current dynamos, and for E balancers. There were three contracts—the main, the running, and the supplemental. His Lordship said he had to decide, in the first place, whether in fact the contractors repudiated their contracts. He held they did. It seemed to him to be enough, in the view he took, that the contractors admitted that the plant and machinery were not in a condition to allow the stipulated tests to be carried out, and that, on the back of this admission, they threw up the contracts and ceased working. By doing this on a day's notice, or rather on a few hours' notice, and withdrawing their workmen from the station, the contractors made it absolutely impossible to apply the provisions concerning the failure of the plant, &c., to satisfy the stipulated tests, or, indeed, any other provisions of the contracts. In the circumstances, he had no doubt that the pursuers were entitled to treat the contracts as at an end; and this, he thought, was what they did substantially as from the date of the contractors' abandonment. The contractors argued that this was not so; that the pursuers did not accept the abandonment, but elected to stand by the contracts and to keep them alive. He, however, did not see his way to give effect to this argument. As regarded the question of delay in electing to accept notice of abandonment, he thought too little attention had been paid to the terms of the Town Clerk's letter of May 15, 1907. This seemed to him, on a fair construction of it, an intimation of the acquiescence by the pursuers in the view that the contracts were at an end. There was certainly nothing to indicate the contrary, or to suggest that the pursuers took any other than this view, or that they meant to hold the contractors to their contracts in any particular at all. But be that as it might, and assuming that the town did not immediately accept the repudiation—that they seriously thought that, in the circumstances, with Johannesburg in darkness, and the inhabitants urgently clamouring for tramways and for light, they had best first of all try to get someone else, on their behalf, to take up the work under the contracts, and complete the unfinished engines, &c.—they very soon found that this was impracticable, and rejected the plant. They were surely then still entitled to do so. The contractors had not in the meantime resumed work, and had not made a proposal to do anything further under the contracts. The station had been left derelict. He thought the fact that the Municipality did not seek to impose any further penalties on the contractors for interruptions in the supply of electricity for lighting and traction under the contracts was cogent evidence of their having accepted the abandonment of the contracts, and so terminated them.

Having dealt with the position of the sureties and with the facts relative to the actual condition of the plant, his Lordship held that as regarded the B plant it was not up to contract requirements, and that the responsibility for this rested with the contractors. As regarded the electrical plant under C, D, and E, no serious objection was taken to it. He afterwards dealt with the claims of parties, and fixed the amount of damages under various heads.

"South Africa" on the Case.

Under the heading of "Last Stage of an Unfortunate Undertaking," "South Africa" last Saturday made the following remarks.

Engineers all the world over have followed with close interest the course of the action brought by the Johannesburg Municipality against Messrs. D. Stewart and Co. (1902), Limited, of Glasgow, with respect to the failure of the extensive plant which was installed for lighting and power purposes. After passing through various Scottish Courts to the House of Lords and back again to Scotland, the case was concluded on Tuesday, and judgment given for the plaintiffs for sums amounting in the aggregate to about £340,000. The main defence with regard to the machinery itself was that the coal supplied was not of the requisite quality to obtain the desired results. On the other hand, it was agreed that the defendants failed to complete the contracts; and it was their abandonment of these, or a part of them, which formed the real litigious basis. The various contentions submitted by the parties involved legal intricacies rather than questions concerning the character of the plant; and the difficulties of arriving at a correct interpretation may be gathered from the fact that the judgment extended to over a hundred type-written sheets. It has been obvious from the first that each side was actuated by an honest belief that the fault lay with the other, and the issue was one upon which a useful opinion could not be formed beforehand. The terms of a contract may seem to be explicit enough until something unexpected happens; but, as the long history of the law proves, even the most carefully chosen language may fail to sufficiently cover quite a host of possible contingencies. In the present case, his Lordship had to address himself largely to the construction which was to be placed on Messrs. Stewart's action in abandoning the contracts; the allegation respecting the coal supplied by the Council being apparently disproved, or at any rate of insufficient importance to weigh as an essential factor. In a detailed examination of the evidence, his Lordship held that the conduct of the Council supported its argument that it had accepted the position that the contracts were at an end, and that it was therefore entitled to succeed. It should be added, to the credit of the defendants, that a large part of the machinery was undoubtedly efficient, and the decision is therefore not to be taken as a reflection on their reputation in general. It was simply a case of a weak link impairing the usefulness of an otherwise perfect chain; and it is for the whole chain that Messrs. Stewart and their surety are now called upon to pay. Equity cannot recognize misfortune under such circumstances; and we feel sure that, while congratulating itself on its success, Johannesburg will sympathize with the honourable firm which is such a heavy loser by the ill-starred transaction that has now reached its last stage.

DAMAGE TO GAS-MAINS BY SEWER CONSTRUCTION.

At the Exeter County Court last Wednesday, Mr. J. A. Hawke, barrister, applied to his Honour Judge Lush-Wilson for an order in regard to the costs of an action brought by the Exeter Gas Company against the City Council. It was to recover compensation for damages caused by the subsidence of the Company's mains owing to the work of making a new sewer in which the Council were for a long time engaged. The mains cracked, and gas escaped; and there was the danger of a serious explosion. Up to the 4th inst., the Company were led to believe that the case would be fought; but on that day the Council paid into Court the whole sum claimed—£35 7s. 4d.—and also the costs. Counsel now asked that they should also pay the costs incurred since the action was brought, and that these should be allowed on the higher scale, on the ground that the matter was one of public interest. The Town Clerk (Mr. H. Lloyd Parry) denied that there had been any waste of time in bringing matters to a conclusion. Mr. Hawke said that for months before the summons was served the Company had tried to come to a settlement, and the Council had endeavoured to "bluff" them into taking less than they were entitled to. The Town Clerk said this was not true. The amount of the claim was not the most important question. His Honour held that the case was not one that came within the definition of "general public interest" in the meaning of the Act. Plaintiffs, however, were entitled to the fees and costs on work done before the notice of withdrawal. Mr. Hawke said there was fear of some future liability; and this was why the Company wished to have the case decided early. His Honour made a formal order for the costs on the lower scale from the time of the issuing of the summons to the time of withdrawal, and also the costs of the present application.

SEQUEL TO A WATER COMPANY'S SUMMONS.

At the Aldershot Police Court last month, a man named Greenwood was fined for affixing a pipe to a surface drain without the consent of the Aldershot Gas and Water Company, and with unlawfully using water for other than domestic purposes. The facts of the case were reported in the "JOURNAL" for Sept. 26. There was a sequel last Thursday, when Greenwood was summoned for non-payment of water-rate.

On behalf of the defendant, it was pointed out that he was summoned in respect of 182,000 gallons of water. He was prepared to pay at the proper rate for 10,000 gallons, which was the utmost amount that could possibly have been used. He formally tendered whatever might be due for 10,000 gallons, and also 5s., the costs endorsed on the summons. Mr. Norman Clinton, for the Company, said, however, that he could not accept this, as he had definite evidence that the quantity of water taken on the nights in question was 12,000 gallons; and his evidence would show that the actual amount was more.

In opening the case, Mr. Clinton said the Company were seeking to recover from defendant the sum of £9 2s. for water which they alleged he had used for filling a cattle pond, under circumstances already recorded. It was stated in evidence that the only other means of water supply defendant had was a pump; and defendant suggested the Company overlooked this fact. He would call evidence to prove that it would be necessary for the pump to be worked for twelve consecutive hours to get the same amount of water that defendant obtained through the pipe.

Aaron Bell, Superintendent in the employ of the Company, explained that the quantity of water for which the Company were suing was on

the basis of 91 nights, from June to Sept. 13, during which period there was practically no rain. They gave defendant the benefit of every alternate night, and were suing for 45½ nights. The estimated consumption was 182,000 gallons, at 1s. per 1000 gallons, which made a total of £9 2s. The capacity of the pump referred to was 333 gallons per hour. Since defendant's conviction, his water supply had been cut off for domestic purposes; and if he wanted water, he used his pump. The Company told him they would only supply him through a meter, which he declined. Since this action by the Company, the cattle kept in the meadow had been removed by defendant.

Mr. Heath, a farmer, whose meadows adjoined Mr. Greenwood's, also gave evidence for the Company. He said he remembered that when the alteration was made to the surface water drainage, it had made a difference to the water supply to Mr. Greenwood's pond. The pond dried up. He knew that Mr. Greenwood kept cattle in the meadow, and that he had done so for several months. He had seen water in the pond during the past three months; but it had now dried up again.

For the defence, it was urged that there was no evidence to prove that the tap had run on and off for three months. On the other hand, according to the Company's own witness, there was a pump there capable of filling the pond. The prosecution were asking the Court to assume too much. The defendant was quite prepared to pay for 10,000 gallons.

The Bench conferred with the Clerk; and the Chairman said they had already decided that 18,000 gallons had been consumed. They only made this suggestion as the standard quantity proved.

Defendant's solicitor at once accepted this, and undertook to pay for 18,000 gallons.

Mr. Clinton asked for costs; and the Magistrates made an order for 18s., and Court fees.

MISCELLANEOUS NEWS.

CONCILIATION IN TRADE DISPUTES.

Formation of an Industrial Council.

The following statement was issued by the Board of Trade last Tuesday night.

His Majesty's Government have recently had under consideration the best means of strengthening and improving the existing official machinery for settling and for shortening industrial disputes by which the general public are adversely affected. With this end in view, consultations have recently taken place between the Prime Minister and the President of the Board of Trade, and a number of representative employers and workmen specially conversant with the principal staple industries of the country, and with the various methods adopted in those industries for the preservation of peaceful relations between employers and employed.

Following on these consultations, and after consideration of the whole question, the President of the Board of Trade, on behalf of his Majesty's Government, has established an Industrial Council representative of employers and workmen. The Council has been established for the purpose of considering and of inquiring into matters referred to them affecting trade disputes; and especially of taking suitable action in regard to any dispute referred to them affecting the principal trades of the country, or likely to cause disagreements involving the ancillary trades, or which the parties before or after the breaking-out of a dispute are themselves unable to settle.

In taking this course, the Government do not desire to interfere with, but rather to encourage and to foster, such voluntary methods or agreements as are now in force, or are likely to be adopted for the prevention of stoppage of work or for the settlement of disputes. But it is thought desirable that the operations of the Board of Trade, in the discharge of their duties under the Conciliation Act, 1896, should be supplemented and strengthened, and that effective means should be available for referring to investigation, conciliation, or arbitration, as the case may be, such difficulties as may arise in a trade.

The Council will not have any compulsory powers.

The following gentlemen, in their individual capacity, have accepted Mr. Sydney Buxton's invitation to serve on the Council, the members of which will, in the first instance, hold office for one year.

EMPLOYERS' REPRESENTATIVES.

Mr. George Ainsworth, Chairman of the Steel Ignot Makers' Association.
Sir Hugh Bell, Bart., J.P., President of the Iron, Steel, and Allied Trades Federation, and Chairman of the Cleveland Mine Owners' Association.
Mr. G. H. Claughton, J.P., Chairman of the London and North-Western Railway Company.
Mr. W. A. Clowes, Chairman of the London Master Printers' Association.
Mr. J. H. C. Crockett, President of the Incorporated Federated Associations of Boot and Shoe Manufacturers of Great Britain and Ireland.
Mr. F. L. Davis, J.P., Chairman of the South Wales Coal Conciliation Board.
Mr. T. L. Devitt, Chairman of the Shipping Federation, Limited.
Sir T. Ratcliffe Ellis, Secretary of the Lancashire and Cheshire Coal Owners' Association, and Joint Secretary of the Board of Conciliation of the Coal Trade of the Federated Districts, &c.
Mr. F. W. Gibbins, Chairman of the Welsh Plate and Sheet Manufacturers' Association.
Sir Charles Macara, Bart., J.P., President of the Federation of Master Cotton Spinners' Associations.
Mr. Robert Thompson, J.P., M.P., Past-President of the Ulster Flax Spinners' Association.
Mr. Alexander Siemens, Chairman of the Executive Board of the Engineering Employers' Federation.
Mr. J. W. White, President of the National Building Trades Employers' Federation.

WORKMEN'S REPRESENTATIVES.

Right Hon. Thomas Burt, M.P., General Secretary of the Northumberland Miners' Mutual Confident Association.
Mr. T. Ashton, J.P., Secretary of the Miners' Federation of Great Britain, and General Secretary of the Lancashire and Cheshire Miners' Federation.
Mr. C. W. Bowerman, M.P., Secretary of the Parliamentary Committee of the Trades Union Congress, and President of the Printing and Kindred Trades Federation of the United Kingdom.
Mr. F. Chandler, J.P., General Secretary of the Amalgamated Society of Carpenters and Joiners.
Mr. J. R. Clynes, J.P., M.P., Organizing Secretary of the National Union of Gas Workers and General Labourers of Great Britain and Ireland.
Mr. H. Gosling, President of the National Transport Workers' Federation, and General Secretary of the Amalgamated Society of Watermen, Lightermen, and Watchmen of the River Thames.
Mr. Arthur Henderson, M.P., Friendly Society of Ironfounders.
Mr. John Hodge, M.P., General Secretary of the British Steel Smelters, Mill, Iron, and Tinplate Workers' Amalgamated Association.
Mr. W. Mosses, General Secretary of the Federation of Engineering and Shipbuilding Trades and of the United Pattern-Makers' Association.
Mr. W. Mullin, J.P., President of the United Textile Factory Workers' Association, and General Secretary of the Amalgamated Association of Card and Blowing Room Operatives.
Mr. E. L. Poulton, General Secretary of the National Union of Boot and Shoe Operatives.
Mr. Alexander Wilkie, J.P., M.P., Secretary of the Shipyard Standing Committee under the National Agreement of 1909, and General Secretary of the Shipconstructive and Shipwrights' Society.
Mr. J. E. Williams, General Secretary of the Amalgamated Society of Railway Servants.

Additions may be made to the above list.

Sir George Askwith, K.C.B., K.C., the present Comptroller-General of the Labour Department of the Board of Trade, has been appointed Chairman of the Industrial Council, with the title of Chief Industrial Commissioner; and Mr. H. J. Wilson, also of the Board of Trade, is Registrar of the Council.

DOMESTIC HEATING AND LIGHTING BY GAS.

This was the subject of a paper read by Mr. Henry Kendrick, of Stretford, at a meeting of the Manchester and Salford Ironmongers' Association last Tuesday. For the following abstract of the paper we are indebted to the "Ironmonger."

At the outset, Mr. Kendrick explained that when he was asked to give some particulars of the industry of gas lighting and heating, he consented to do so because he thought ironmongers should take up the work in connection with that industry. Gas managers had found that plumbers were wanting in appreciation of modern methods; and certain projects of the managers of gas-works tended to separate the trades of plumbing and gas heating. They thought gas engineering should be a trade by itself, and that ironmongers taking up gas-fitting as a branch would do well to cultivate it. A man trained chiefly in sanitary work was not the one to deal with complicated gas apparatus. Scientific principles were now involved, and the average plumber was not up to the work. Many ironmongers were better trained for it. A company had a freer hand in such matters than a corporation. He had been under the latter authority and knew this. His present Directors required plumbers to undergo an examination by their Gas Manager before they could get an authorization; but this was not the case with corporations.

The problems of lighting and heating were always with them. The first problem was ventilation. He suggested ventilation at floor and ceiling levels, where there would be less trouble. Experiments had shown that a small burner would set in motion large bodies of air. Four cubic feet of gas burnt per hour could change the air in a large room in the course of an hour. With regard to burners, the inverted was now by far the most popular. The best form of inverted burner gave 25-candle power for each cubic foot of gas burnt. He advised the use of burners with adjustable nipples—the mantle to fit exactly. Without an adjuster, the exact quantity of gas would not pass without considerable trouble. The lighting power was affected adversely both by excess and by deficiency of air. On the perfect admixture depended the perfection of the light. Hence he discouraged the use of cheap burners. The mantle should be well impregnated with thorium and cerium. Inverted mantles at 30s. and 40s. per gross were cheaper in the end than low-priced mantles. He recommended high-pressure gas lighting; the regulation to be performed at the burner. In fitting burners, however good the adjustment, the flame must fill the mantle, which should be incandescent at every part.

As to the maintenance of burners, this was very important. Most complaints of reduced light after a week or two of use were caused by neglect of burners. They should be frequently cleaned, and well cleaned, because the dirt was burnt on to the metal. The dirt had sometimes to be cut away. Unless this was done, cross-currents were formed, with the result that the adequate percentage of air could not be drawn in. Corroded nipples interfered with the quantity of gas passing, resulting in reduced light. Choked gauze prevented the proper distribution of the gas over the mantle. A perfect mantle confined the gas under pressure; but if there were a rent, the pressure was lost and the flame impinged on the glass and was likely to break it. Hence no imperfect mantle should be left on the burner. He had made some tests as to the use of shades and their effect on illumination, and found that a great deal of light was lost by the use of green and red shades; and also that the furniture and paper or wall decorations of the room had a great effect in this direction. Opal glass shades should never be used except as reflectors. Palest shades of colours were recommended. Ruby shades cut down the candle power by nearly 50 per cent.; and pale green reduced it by a smaller amount. Yellow reduced the candle power least of all.

Heating was in a transition stage. The modern gas-fire would heat a room with not more than half the gas consumption of a few years ago. Devices now on the market would give a better result than solid fuel. The heat thrown out was largely radiant; and Mr. Kendrick gave some information as to the difference between the results of radiant and of convected heat. He said radiant heat was a pleasant

form of heating, and convected heat an unpleasant form. Modern gas-fires gave 50 per cent. of radiant heat and 25 per cent. of convected heat; and some gave 60 per cent. of the former. With a coal-fire, the heat carried up the chimney was four times as much as with a gas-fire. Modifications in the manner of arranging the fuel for gas-fires were dealt with; and it was pointed out that a great improvement had been carried out by the reduction of the quantity of the fire-clay balls or asbestos used. The duplex burner was referred to, by which some of the jets could be put out of action so as to avoid lowering the pressure of the gas so as to reduce the fire when less heat was wanted. The advantage of gas heating in the matter of cleanliness was pointed out.

PUBLIC LIGHTING OF HOLBORN.

Another step has been taken by the Holborn Borough Council in the long and tedious path that will eventually lead to the better lighting of the streets of the borough. At the meeting of the Council last Wednesday, the Finance Committee presented a report on the subject. They reminded the Council that on the 26th of July last they decided to accept the joint tender of the Gaslight and Coke Company and the Metropolitan Electric Supply Company for lighting the streets of the borough for ten years for the sum of £7645 per annum, subject to the consent of the London County Council being obtained to the form and principle of the contract. Owing to the view taken by the District Auditor that entering into a contract in the form proposed, necessitating as it did a certain amount of capital expenditure at once by the Companies concerned, which was to be paid for over a period of ten years, amounted to taking up a loan by the Borough Council, it had become necessary to apply to the County Council for sanction. The amount would not, of course, be actually borrowed; and it was only to make legal the form of contract proposed that the step had to be taken. The Town Clerk had been in consultation with both of the Companies concerned, and they had agreed that the amount for which sanction should be applied was £8000—this being, in fact, the sum which they would expend upon the alterations and additions proposed in the lighting of the streets, and did not include any sum for additional works which would remain their property. The Committee therefore recommended that application should be made to the County Council for sanction to the borrowing by the Borough Council of the amount-named; and the recommendation was carried *nem. con.*

INCANDESCENT GAS FOR SCHOOLS AND HOSPITALS.

At the last meeting of the Metropolitan Asylums Board, a report was received from the Assistant-Engineer with reference to the results obtained by the installation of new inverted incandescent burners, which were substituted for the flat-flame burners and upright incandescent burners formerly in use at the White Oak School, Swanley Junction. In the report it was stated that 478 new burners had been installed (to replace 611 other burners), at a cost of £123. The quantity of gas consumed in the twelve months ended Midsummer last, during which period the burners were in use, was 1,799,600 cubic feet, against 2,829,000 cubic feet in the preceding year—showing a reduction of 1,029,400 cubic feet. The saving effected by the lower consumption of gas, less the cost of renewals, amounted to £122; the new lamps having practically paid for themselves in twelve months. The Hospital Committee reported that considerable economies could be realized in the lighting of the Joyce Green Hospital by an alteration in the type of burner at present in use. They had obtained from the Assistant-Engineer a report in which he stated that if the present 2016 burners were replaced by 1676 high-efficiency inverted burners of the types which had proved so satisfactory at the White Oak School, there would be an annual saving of £220 per annum when the hospital is partially occupied, of £130 per annum when almost unoccupied, and of £310 per annum when fully occupied. The cost of carrying out this change, including the necessary new piping, &c., and the work of fixing, would be approximately £475. The Committee were strongly of opinion that this alteration should be made, as when the hospital was almost unoccupied £130 per annum would be saved, which would pay for the cost of the alterations in less than four years; while if it were more fully occupied, the cost would be recouped in a proportionately shorter time. Moreover, there would be a general improvement in lighting. The Committee have accordingly decided to have the work carried out.

Scarcity of Water in Dublin.—Dublin is threatened with a serious deficiency of water. Its daily consumption amounts to about 14 million gallons; and at this rate the great reservoir at Roundwood, in Co. Wicklow, which supplies the city from the River Vartry, will be emptied in a short time. The reservoir's normal summer fall below a fixed level is 8 feet. At present it is 17 feet—a depth which has not been touched since 1893. There was practically no rainfall on the Vartry's watershed during the summer, and the springs are all dry. The Corporation have issued notices impressing the citizens with the need of strict economy.

Profit-Sharing in the Chester Gas Company.—The profit-sharing scheme in operation in the Chester Gas Company recently completed its tenth year of existence; and Mr. James Frost, the Chairman of the Board, informed the men participating that they possessed £1260 of the Company's stock, and had in addition £845 standing to their credit. These results, he said, had not been obtained by charity. The bonuses had been earned by intelligent interest being taken by the men in their employment, by the exercise of care, and generally by prompt attention to instructions. At the present moment, said Mr. Frost, manufacturers and employers of labour generally were watching with the keenest interest schemes such as theirs, having for their object the participation by the workers in the prosperity of the undertaking which afforded them employment.

LIVERPOOL GAS AND LIGHTING DEPARTMENT.

A Year's Work.

At the Meeting of the Lighting Sub-Committee of the Tramways and Electric Lighting Committee of the Liverpool Corporation last Friday, the Chairman (Mr. W. W. Walker) said the year now closing had been a busy one, and that the work performed by the Committee in the lighting department had been of a progressive nature. Since the year 1865, the standard illuminating power of the gas in Liverpool had been 20 candles with the flat-flame burner; but during the past year, owing to the adoption by the Gas Company of the No. 2 "Metropolitan" argand burner, this standard had, by agreement, been reduced to 18 candles as tested by the flat-flame burner—the old standard being still maintained when the gas was tested by the new burner. The wisdom of this course had been fully demonstrated by the substantial reduction of 4d. in the price of gas, which now stood at the low figure of 2s. 1d. per 1000 cubic feet for ordinary consumers, and 1s. 10½d. for street lighting. The long-standing dispute with the Company as to who was responsible for the cost of laying services to lamps in passages had been settled during the year by both parties agreeing to pay half the entire cost to date, and the Corporation undertaking in future to pay for these services at the rate of 1s. per yard. Automatic lighting had made more progress in the past twelve months than in any preceding year; the districts of Garston, Fazakerley, and Walton being now completely installed with this system of lighting. Owing to the establishment of a meter manufactory in Liverpool in March last, there had been a large increase in the number of meters tested. The total for the twelve months was 12,927—an increase of nearly 2000 on the previous year's figures. Gas-fitting work in Corporation establishments had progressed abnormally; but lighting in unadopted streets had not shown quite the usual activity. The usefulness of the testing of gas pipes and fittings was still demonstrated by the fact that only 12 per cent. of those tested last year were found to be sound.

PRICE OF GAS AT NEWCASTLE.

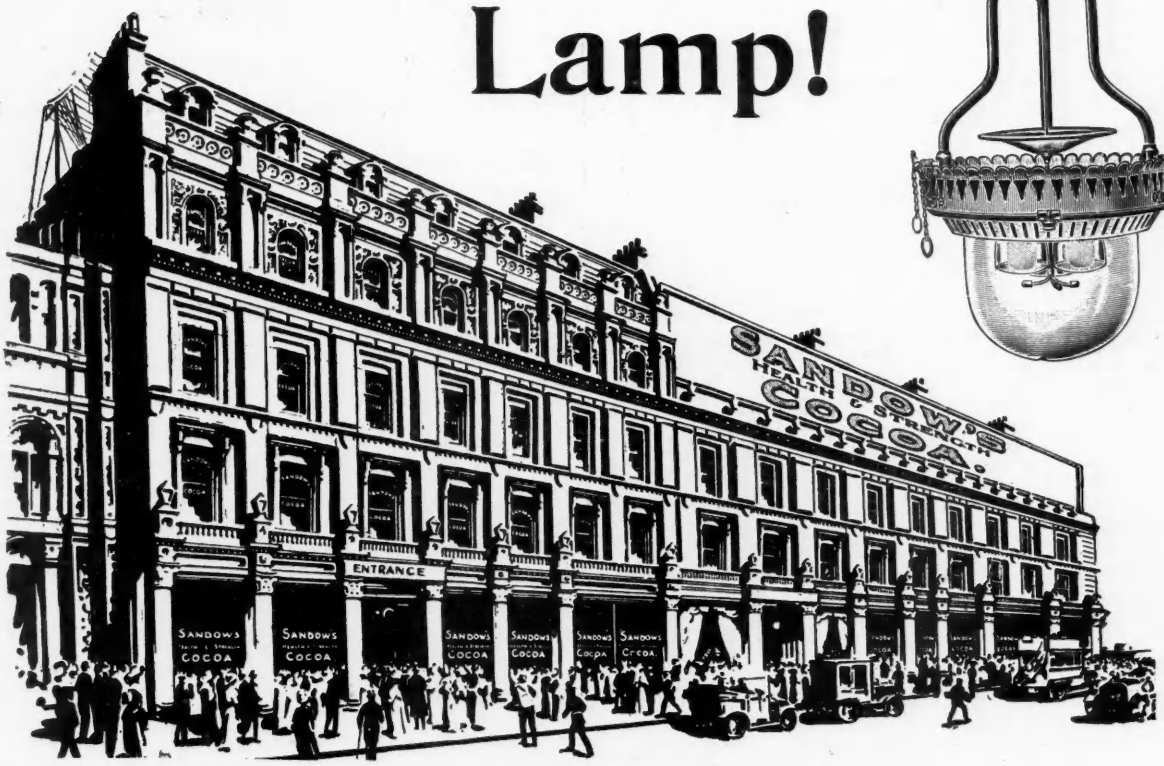
A Reduction Announced.

A large number of members of the Newcastle and Gateshead Corporations last Tuesday morning paid a visit of inspection to the Redheugh Gas-Works, on the invitation of the Newcastle and Gateshead Gas Company. On arrival, the visitors were split up into three sections, and shown round by the Engineer (Mr. T. Hardie), the Secretary (Mr. Thomas Waddom), and the Manager of the works (Mr. Norman Reid). After two hours spent on the works, the party were conveyed to Tilley's Rooms, in Market Street, where lunch awaited them.

Sir W. H. Stephenson presided at the luncheon; and, after the Loyal Toast had been duly honoured, he proposed "The Corporations of the City and County of Newcastle-on-Tyne and County Borough of Gateshead." He remarked that he was in somewhat of an anomalous position, because he was not only Lord Mayor of Newcastle, but also Chairman of the Board of Directors of the Gas Company; so that he was, that day, both the host and the guest. As a Director of the Gas Company, he wished to explain that for some time past it had come up at the Board meetings in connection with the distribution and manufacture of gas in this district (over which he might say they had a monopoly), that it was only right their chief customers should be put in possession of what they intended to do. The two Corporations of Newcastle and Gateshead were among their best customers—only exceeded by the North Eastern Railway Company and Messrs. Armstrong, Whitworth, and Co. This, then, was their object in inviting them there that day; for the Gas Company were contemplating some big developments. In the first place, they intended to lower the price of gas by 1d. per 1000 cubic feet. This would take effect from the end of the current year. The price was raised—in consequence of dear coal—in 1908, from 2s. to 2s. 2d.: and it had not been found possible since then to reduce it. It would interest the Corporation to be informed that the question of the practically obsolete method of carbonization at the old Elswick works had, now that the consumption of gas was increasing, become one of urgency. The system in the retort-houses was still substantially the same as when the works were erected in 1859. The subject of lessening the cost of carbonization by adopting modern methods was being contemplated by the Board; and it was highly probable that in the immediate future such changes would be effected as would have the result of a further reduction in the price of gas. The cost of the change of methods would, of course, be largely paid out of revenue. The Corporation would remember and appreciate the position of the Company with regard to the raising and lowering of the price of gas. Under Acts of Parliament, the dividends due to the shareholders could only be increased by first reducing the price of gas to the consumers; and when the price was increased, the dividends must be reduced—both operations being in proportion to the benefit or the reverse to the consumers. One penny in gas meant a difference of 2s. 6d. per cent. in dividend. In view of the possiblities of further industrial disturbances, checking the consumption of gas and increasing the cost of manufacture—and the necessity of providing for the changes to which reference had just been made—it must be understood that the Directors took some risk in deciding to reduce the price of gas at the present time. Parliament was continually putting fresh obligations upon corporations which must necessarily send up the rates; but, when they thought of the privileges now-a-days enjoyed, he did not think the citizens would complain at the increase in the rates.

The toast was responded to by the Sheriff of Newcastle (Councillor R. H. Millican) and the Deputy-Mayor of Gateshead (Councillor J. Maccoy). "The Newcastle-upon-Tyne and Gateshead Gas Company" was proposed by the Deputy Lord Mayor of Newcastle (Councillor C. S. Shortt), and responded to by Sir Walter R. Plummer, D.C.L., J.P. Sir Walter Plummer said that there were 150 bye-products of gas tar, which was itself a bye-product; and one of these was lyddite—one of the most powerful explosives known.

This is the Lamp!



"SILVA" 96 BRITISH MADE LAMPS

125—1000 Candle Power.

Have recently been installed for Lighting the interior of Mr. Eugen Sandow's New Cocoa Works, illustrated above.

"SILVA" LAMPS (INDOOR & OUTDOOR)

ARE NOW BEING

Extensively Used for Shop and Factory Lighting with Great Success.

This is no doubt due to the following facts:—

"SILVA" LAMPS ARE

- HANDSOME IN APPEARANCE.
- INEXPENSIVE TO INSTAL AND MAINTAIN.
- UNIVERSAL SATISFACTORY RESULTS.

THEIR USE .. MEANS NO .. EXPERIMENT.

OUR NEW 16-Page BOOKLET, showing the most UP-TO-DATE LAMPS FOR SHOP LIGHTING, &c., is now ready.
May we send you a supply with your name, &c., on in place of ours?

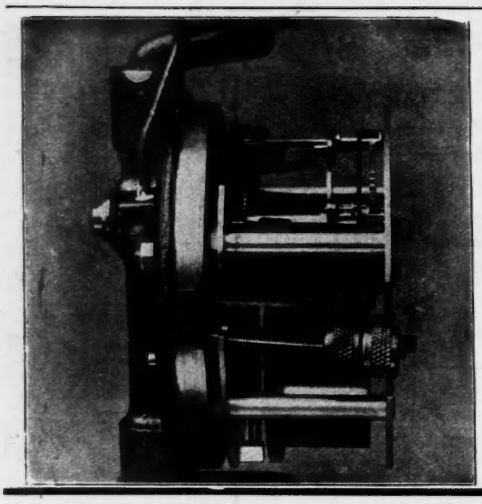
Telegrams: "GLASSWARE LONDON."

J. & W. B. SMITH,

A B C Code, 5th Edition, used.

GAS LIGHTING SPECIALISTS,

17-23, FARRINGDON ROAD, LONDON, E.C.



THE IDEAL LIGHTER AT LAST.

The "Automaton" Lamp Controller

can now be seen in active operation at

39, Victoria Street, Westminster, S.W. (1st Floor).

YOUR CRITICAL INSPECTION IS CORDIALLY INVITED.

FULL PARTICULARS OF

AUTO-LIGHTER, Ltd., 17, Victoria St., Westminster, S.W.

FENLON'S BOILERS AND GEYSERS.

THE "DWARF-LORNE" (Cast-Iron) GAS BOILER AND RADIATOR COMBINED,

Both fitted in Motor House, &c.

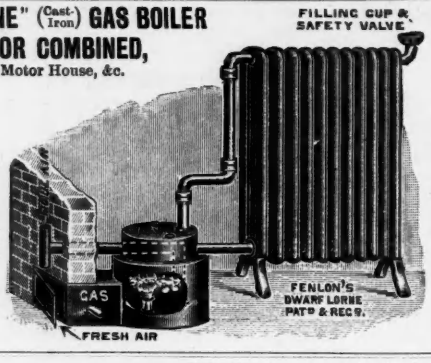
The only make with Safety Valve (Fenlon's Patent).

No outside shed necessary

All heat from boiler utilized inside.

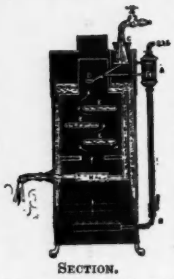
Lighting from outside and flue passing to outer air, no gas fumes can enter the house.

THE IDEAL SYSTEM FOR PURE HEAT.



THE "TUDOR" GEYSER.

"THE LAST WORD IN GEYSERS" with Automatic Eccentric Valve.



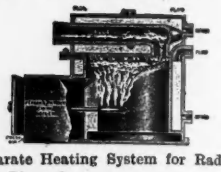
SECTION.

The Valve is made entirely of metal, and having no rubber or leather parts is practically indestructible

As the "No trouble" Geyser it will appeal to Gas Managers for hiring out.

THE "TWIN" (Double Compartment or Duplex) BOILER.

Two Boilers from one fire. Giving perfectly clean water for Domestic Supply (no discoloration), and also a



separate Heating System for Radiators, Pipes, &c.

Easily cleaned without disconnecting a single pipe.

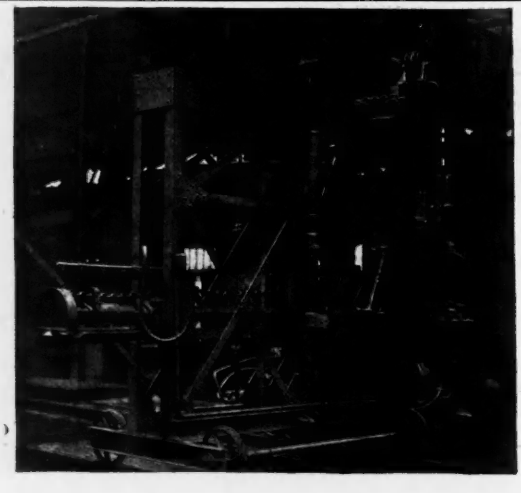
Full Particulars (List 27) sent free on request.

FENLON & SON and G. SHREWSBURY & CO., 8, Tudor Street, London, E.C. ESTABLISHED 1866.

NOTICE.

Full Particulars regarding the MERRIFIELD-WESTCOTT-PEARSON Water Gas Plants may be had on application to the Patentees at

19, ABINGDON STREET, WESTMINSTER, S.W.



Williams & M'Phee's Patent

HYDRAULIC COKE DISCHARGER

is in **OPERATION** at

or on order for

POPLAR (4 Machines),
WAPPING (2 Machines),
(Commercial Gas Company.)
LIVERPOOL (Repeat order),
BRIGHTON,
SAN PAULO.

SOLE MAKERS **W. C. HOLMES & CO., LTD.**
HUDDERSFIELD AND LONDON.

FELIXSTOWE ELECTRICALLY CENSURED.

"Meteor" of the "Electrical Times" appears to be wroth with almost everybody and everything at Felixstowe—save the electricity undertaking. He grumbles over the actions of the local Council, finds fault with the Gas Company, and complains that gas is the means of lighting and heating in the Spa Pavilion; and irritation blossoms out into making extravagant statements—such as "the preponderance of evidence against the use of gas in spa pavilions elsewhere is somewhere in the neighbourhood of one thousand to one." The cause of this new-born interest in Felixstowe is an advertisement in the advertising columns of the Spa Pavilion programme, of which the following is a reduced copy:

GAS for Lighting GAS for Heating GAS for Cooking

THE SPA PAVILION

is Lighted by INVERTED GAS-LAMPS

AUTOMATICALLY controlled from Switchboards.

¶ The BUILDING is also heated with GAS-HEATED STEAM RADIATORS.

GAS IS THE CHEAPEST, MOST EFFICIENT, & HEALTHIEST ILLUMINANT.

¶ "When the Society of Medical Officers have decided to evict Electricity from the Meeting and Exhibition Rooms on their premises, it may be taken that they have some good and sufficient reason for doing so.

THE FELIXSTOWE GAS LIGHT COMPANY,

Show-Rooms—HAMILTON ROAD.

On the opposite page is a smaller advertisement referring to the electricity undertaking, which winds up with "Support your Council's Electricity Works." This is a suggestion for "pure altruism" on the part of the ratepayers that they are not prepared to freely adopt. As a matter of fact, while the Council have found the capital for the concern, a Company run the undertaking—a Company with a somewhat chequered career—and they pay the Council interest on the money. The Council, on the other hand, have other interests of the ratepayers to look after; and among them they have to see that light is obtained for public purposes in the cheapest market. So the Spa Pavilion is lighted and heated by gas. "Meteor" takes exception, and he wriggles painfully round about it, to the statement in the Gas Company's advertisement as to the eviction of "electricity" from the meeting and exhibition rooms on the premises of the Society of Medical Officers of Health. If for "electricity" we substitute "electric light," and add that electricity fills the humble office of working a fan supplying air to the air-warming radiators, which are fed by hot water circulating from a gas-boiler, and that another fan is used, when the meeting-room is crowded with members of the Society, to cause a rapid change of air in the room, then "Meteor" can have no further ground for objection. At all events, he will not forget what was said by the President at a meeting last session, that since the change in the lighting and heating arrangements had been effected, the atmospherical conditions of the meeting-room had much improved.

ELECTRICAL MISSTATEMENTS.

How Public Lighting "Savings" are Calculated.

An instance of truth distortion in our electrical contemporaries (in this case no doubt editorially unintentional in view of the information received) is shown by the following. This paragraph appeared in the "Electrician:" "Over 100 of the street lamps [of Caversham] are now converted to electric lamps; and the work of substituting electric for gas lighting in the remainder of the district is making rapid progress. Electric current is supplied by the Reading Electric Supply Company. In each of the old lanterns two electric globes are being placed, in addition to a reflector; and the light thus obtained is much superior to that provided by the gas-lamps. The members of the Council estimate the saving in the cost of lighting by electricity at £100 a year." Writing to the "Reading Mercury," in reference to this matter, Mr. D. H. Helps, the Engineer and Manager of the Reading Gas Company, says: "In your issue of the 23rd ult., a statement appeared to the effect that the substitution of electric for gas lamps in Caversham had saved the ratepayers money. This statement is misleading. The facts are, that the charge for electric lamps, extinguished at eleven o'clock, is £1 17s. 3d. per lamp per annum, as compared with the Gas Company's charge of £1 12s. 2d. per lamp from the 30th of June last—the difference being no less than 5s. 1d. per lamp in favour of the gas; and, as there are some 240 of these lamps in the district, the cost to the ratepayers would have been about £60 per annum lower if the gas-lamps had been retained. Also there would have been no necessity to break up the roads in the district at considerable cost for excavation and reinstatement. May I also point out that the charge for the electric-lamps is based on a ten years' contract; whereas it is probable, in the case of gas, that further reductions in the charge for lighting would have been made." The manner in which the electricity people calculate the "savings" in Caversham is precisely how the Marylebone Electricity Department calculate the "savings" on their public lighting. Current conditions do not count. They are inconvenient.

NEW RESERVOIR FOR DEVONPORT.

The new reservoir constructed by the Devonport Corporation a Crown Hill, a few miles from the town, has recently been opened. There was a large gathering of members of the Corporation and borough officials at the intake, where Alderman E. Blackall, the Chairman of the Water Committee, formally turned on the water. He explained that the reservoir would contain 21 million gallons of water, and with the five existing reservoirs the storage would be increased to 45 million gallons. The average daily consumption was 3 million gallons. They had seven filter-beds, and another was in course of construction. The cost of the undertaking up to the present had been £345,000. At a luncheon which followed the ceremony, the Mayor (Alderman W. Littleton) presented Mr. Blackall with a silver salver, subscribed for by members of the Corporation and officials, as a memento of the occasion. In acknowledging the gift, he said the water supply would be sufficient to meet all requirements for many years to come. Hitherto they had been short of storage, and while there had been plenty of water they had had the fear of famine both in the summer and winter months. The undertaking had so far not cost the ratepayers anything; and he was of opinion that there would be no charge on the rates for at least ten years—perhaps not at all. The construction of the reservoir had been carried out by direct labour; and the Water Engineer (Mr. F. W. Lillicrap) prepared the plans, and superintended the work. Mr. Lillicrap said that shortly after the Corporation acquired the undertaking they obtained parliamentary powers to spend £80,000 on extensions. In November, 1907, they began the projected works with the laying of a pipe-line to take the place of 5¼ miles of the leat, and constructed a service reservoir at Dousland. The construction of the reservoir now completed was begun on Oct. 19, 1908. Its area, including the banks, was 6½ acres. The designing, estimating, and carrying out of the works had been performed by the Water Department of the Corporation, without one single outsider being asked for assistance or advice.

BURNLEY'S NEW WATER-WORKS.

The Burnley Corporation are having constructed at Hurstwood, by Messrs. Macdonald and Deakin, of Westminster, a new reservoir; and last Thursday week the commencement of the work was celebrated by a visit of the members of the Town Council and the performing of a little ceremony by Mr. John Thornber, the Chairman of the Water Committee. The contract price is £159,000; but when completed the total cost, it is estimated, will be about £250,000.

On the arrival of the party at the works, the Mayor (Alderman Grey) invited the Chairman of the Water Committee to lay the stone commemorating the formal commencement of the reservoir. The Mayor stated that the capacity of the present reservoirs was equal to 125 days' consumption at 25 gallons per head; and he impressed upon all concerned the necessity of pushing on with the new works. Mr. Thornber laid the stone, and was accorded a vote of thanks, as also were the Contractors for their hospitality. Mr. Deakin, in his reply, said they would do their best to make a good job of the reservoir and finish it inside contract time. The party were shown round the works by Mr. Stanley Diggle, son of the Consulting Engineer, Mr. James Diggle. Mr. Diggle explained that the reservoir would have a capacity of 320 million gallons, and would tower 105 feet above the level of the Hurstwood stream.

On the party returning to Burnley, dinner was served at Cronkshaw's Hotel; and here Mr. James Diggle presented the Mayor with a silver cigar-box, and Mr. Thornber with a silver rose-bowl, as mementos of the occasion. Both gentlemen warmly thanked Mr. Diggle for his gifts. The toasts of "Success to the Hurstwood Reservoir," "The Engineer and his Staff," and "The Contractors" were honoured. Mr. Diggle said no effort would be spared on his part to secure a successful issue. When one considered the distance Manchester, Leeds, Liverpool, and other cities had to bring their water, Burnley was fortunate in having such an excellent supply within 4 miles of the town. They were even more fortunate in being able to save the cost of aqueduct and maintenance charges, as in this case it was a valley connected with all their existing works, and as such would form one complete water-works. Mr. Diggle forecasted that in the future towns would have to combine to get a water supply, as it would be too costly a matter for one town alone. He assured his hearers as to the purity of the water on the new site.

Municipal Employees and Non-Unionists.—At a meeting of the Manchester and Salford Trades Council, called for to-morrow evening, the following resolution is down for discussion: "That this Council declares it to be absolutely necessary to demand that all men in the employ of the Corporation of Manchester and Salford should forthwith become members of their Trade Unions. Further, that it be a request to all trade unionists to vote only for those municipal candidates who state definitely that they will support this demand."

Rochdale Gas Workers' Wages.—At their meeting last Wednesday, the Gas Committee of the Rochdale Corporation confirmed the recommendations of a Sub-Committee appointed to deal with the application made some time ago by the Gas Workers' and General Labourers' Union for advances of pay to various classes of men employed at the works. The increases recommended include 2s. a week to certain firemen and coke wheelers; but the application of the stokers for 5s. 6d. per shift of eight hours in place of 5s. 3d. was deferred until the new vertical retorts are in full operation. The Sub-Committee could not see their way to recommend the following advances asked for: Stillmen, from 6½d. to 7½d. per hour; tarmen, from 5½d. to 7d. per hour; saltmen, to 6d. per hour; yardmen (about 50 in number), from 5½d. to 6d. per hour; lamplighters, 1s. per week; and lamplighters and cleaners an extra 2s. weekly.

NOTES FROM SCOTLAND.

From Our Own Correspondent.

Saturday.

It was only the other day that the North British Association of Gas Managers were considering the subject of "The Need of Publicity," introduced by Mr. W. M. Mason and Mr. J. Napier Myers. Yesterday, in the "Glasgow Herald," there was to be found a most convincing illustration of one of the best methods by which the desiderated publicity may be obtained. This enterprising paper devoted a whole page to the education of its readers upon the subject of "Coal Gas and Its Uses." Half of the page was occupied with letterpress matter, under the headings of "In the Home," "In Industry," "Hygienic Aspects," and "The Smoke Problem;" and the other half of the page was devoted to advertisements of the Glasgow Corporation Gas Department show-rooms, and of a number of the leading gas appliances on the market for lighting, heating, and cooking. The letterpress matter was so exceedingly well written—concise, yet, so far as entering into details, of the most up-to-date character—that it was easy to recognize that the author is one whose daily life is spent in strenuously disseminating a knowledge of the advantages to be derived by the community from a more extended use of coal gas. The fact shines out of every passage in the four articles. It is difficult to say which is most to be appreciated—the devotion of the author to the subject, or the willingness of the proprietors of the "Herald" to allow a subject, not always recognized to be of so much importance as it in reality is, to be so fully and efficiently ventilated in their columns. We can only admire the spirit which has animated both, and entertain the wish that the same spirit may be the occasion of other similar effusions in days to come; and that in other populous centres it may be found possible to give an imitation—it may be a remote one—of that which has been done, and done so well, in the columns of the "Glasgow Herald" of yesterday.

In the Hamilton Town Council on Tuesday, a Sub-Committee reported that they had received a report from the Gas Manager upon a proposal to give a supply of gas to Blantyre, and that they had had two meetings with representatives of the Blantyre district. The Sub-Committee entered upon the negotiations on the footing that if the quantity of gas consumed were under 30 million cubic feet per annum, the price charged should be 5d. per 1000 cubic feet above that which was being paid at the time in Hamilton; and that if the consumption were more than 30 millions, the extra charge should be 2½d. per 1000 cubic feet. The representatives of Blantyre expressed themselves as favourable to the rates mentioned; and they agreed to lay the proposals of the Sub-Committee before the County Council. In view of this, the Sub-Committee were authorized to continue their negotiations with the Blantyre representatives, and to report again. Bailie Anderson reported that a Sub-Committee had met the General Manager to Messrs. Archibald Russell, Limited, coalmasters, with reference to a petition signed by 106 householders in Greenfield Rows, asking to be supplied with gas. The Sub-Committee were informed that the Company were perfectly agreeable that gas should be installed in the houses, but that they were against incurring any expense in connection with its introduction. The subject was sent back to the Committee to consider further; and Bailie Anderson gave notice of a motion to the effect that the Council rescind their resolution prohibiting the Gas Committee from piping properties where no gas-pipes exist.

In the Kirkcaldy Town Council on Monday, it was reported that the Burgh Chamberlain had submitted a statement showing that the balance of the amount due to the Gas Company for their undertaking had been paid on Sept. 1. The price, as per the award, was £137,150. Interest upon this from May 31, 1910, to May 18, 1911, at 4 per cent., less periodical interest at the same rate on the sums appropriated by the Company for its own uses (£5102, less £298) amounted to £4804—making a total of £142,954. The amount of the taxed expenses of the Company in the arbitration was £3427, less £57, as the amount of the taxed expenses of the town in the Court of Session action—£3370. The total sum due to the Company was £145,324. Of this, there was paid on May 18, £129,860, and on Sept. 1, £3256. There was a sum belonging to the town in the hands of the Company—retained by the Company at the settlement, and applied towards payment of the sum due to the Company—of £12,208, which made the amount up to the £145,324. There was submitted to the Council a statement showing how the Town Council's account to the Gas Department would be affected by adoption of the Burghs Gas Supply (Scotland) Act, 1876. It was explained that the Act provided that the price charged should be the same to all consumers under like circumstances, and that the revenue of the Gas Department should be credited with an amount in respect of gas consumed for public purposes calculated at the rates charged to private consumers, which amount should be charged upon the rates leviable for public lighting. The Council accordingly resolved that public lighting should be charged at the current price of 3s. 2d. per 1000 cubic feet, less the discount applicable to private consumers of corresponding amount—viz., 17½ per cent.

The Bothwell and Uddingston Gas Company, Limited, of which Mr. L. Hislop is Manager, have reduced the prices of gas, as from Nov. 1, to the following figures: To ordinary consumers, 2s. per 1000 cubic feet; for industrial purposes, 1s. 9d.; for motive power, 1s. 8d.; and through prepayment meters, 2s. 6d. This is about the lowest all-round list of prices I have heard of as being charged in Scotland.

It was reported to the Dunfermline Town Council on Monday that the Gas Committee had before them an estimate, made by the Gas Manager, of the revenue and expenditure for the year ending May 15 next, which had been prepared on the footing that the prices charged for gas within the city should remain the same, and that the price to be charged within the Limekilns area should be reduced from 4s. 3d. to 4s. per 1000 cubic feet, and which showed a credit balance of £250. The Gas Committee adopted the estimate, and recommended it to the Council, who agreed to it; and the prices to be charged for gas were fixed accordingly.

The Directors of the Larkhall Gas Company, Limited, have reduced the price of gas from 2s. 11d. to 2s. 9d. per 1000 cubic feet, and are to give 24 cubic feet (instead of 22 cubic feet) for 1d. to prepayment consumers. It has also been resolved to abolish meter-rents—these arrangements to take effect as from the next survey.

It was reported to the Glasgow Town Council on Thursday that there were in private streets and courts in the city on Aug. 31 last 3087 flat-flame gas-burners—a decrease of 191 during the month—and 2668 incandescent gas-burners—an increase of 205. Of stair lights, there were 21,570 incandescent gas (an increase of 461), 2246 electric, and 43,265 ordinary gas-jets—a decrease of 438.

The litigation to which I have referred at intervals since 1908 as being

GAS COMPANIES' STOCK AND SHARE LIST.

Referred to on p. 168.

Issue.	Share	When ex. Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.				£ s. d.
1,551,868	Stk.	Oct. 12	5	Alliance & Dublin Ord.	79—82*	+½	6 1 11
374,000	Stk.	July 14	4	Do. 4 p.c. Deb.	93—95	..	4 4 3
250,000	5	Sept. 28	7	Bombay, Ltd.	6—6¾	..	5 7 8
50,000	10	Aug. 31	15	Bourne-mouth Gas & Water Co. B 7 p.c. Pref. 6 p.c.	28½—29½	..	5 1 8
311,810	10	,,	7		16½—16⅝	..	4 3 7
75,000	10	,,	6		14½—14⅝	..	4 1 4
380,000	Stk.	Aug. 16	13	Brentford Consolidated	256—261	..	4 19 7
330,000	,,	,,	10	Do. New	198—203	..	4 18 6
50,000	,,	,,	5	Do. 5 p.c. Pref.	120—122	..	4 2 0
206,250	,,	June 15	4	Do. 4 p.c. Deb.	97—99	..	4 0 10
220,000	Stk.	Aug. 31	11	Brighton & Hove Orig.	217—222	+1	4 19 1
246,320	,,	,,	8	Do. A Ord. Stk.	156—159	..	5 0 8
490,000	20	Sept. 28	12½	British	44½—45½	..	5 9 11
120,000	Stk.	June 30	4	Do. 4 p.c. Deb. Stk.	94—96	..	4 3 4
109,000	,,	Aug. 16	6	Bromley, A 5 p.c.	115—120	..	5 0 0
165,700	,,	,,	4½	Do. B 3½ p.c.	89—91	..	4 18 11
82,278	,,	,,	5½	Do. C 5 p.c.	105—110	..	5 0 0
55,000	,,	June 30	3½	Do. 3½ p.c. Deb.	82—84	..	4 3 4
250,000	Stk.	,,	4	Buenos Ayres 4 p.c. Deb.	95—97	..	4 2 6
100,000	10	—	—	Cape Town & Dis., Ltd.	2—3	..	—
100,000	10	—	—	Do. 4½ p.c. Pref.	4—5	..	—
100,000	Stk.	June 30	4½	Do. 4½ p.c. Deb. Stk.	80—83	..	5 8 5
157,150	Stk.	Aug. 16	5	Chester 5 p.c. Ord.	107—109	..	4 11 9
1,513,280	Stk.	,,	5/9/4	Commercial 4 p.c. Stk.	110—112	−1	4 17 7
560,000	,,	,,	5½	Do. 3½ p.c. do.	105—107	..	4 19 8
475,000	,,	June 15	3	Do. 3 p.c. Deb. Stk.	76—78	..	3 16 11
800,000	Stk.	May 31	4	Continental Union, Ltd.	80—83	−5	4 16 5
200,000	,,	,,	7	Do. 7 p.c. Pref.	135—137	..	5 2 2
492,270	Stk.	—	5½	Derby Con. Stk.	122—124	..	4 8 9
55,000	,,	—	4	Do. Deb. Stk.	104—105	..	3 16 2
840,150	10	July 28	10	European, Ltd.	18½—19½	..	5 2 7
16,16,1,600	Stk.	Aug. 16	4/14/8	Gas-light and Coke 4 p.c. Ord.	104½—105½	..	4 9 9
2,600,000	,,	,,	3½		84½—86½	+½	4 0 11
4,062,235	,,	,,	4		102—104	..	3 16 11
4,531,705	,,	June 15	3		80—82	..	3 13 2
258,740	Stk.	Sept. 14	5	Hastings & St. L. 3½ p.c.	94—96	..	5 4 2
82,500	,,	,,	6½	Do. do. 5 p.c.	—	..	—
70,000	10	Oct. 12	11	Hongkong & China, Ltd.	17—17½*	..	6 5 9
131,000	Stk.	Sept. 14	7½	Ilford A and C	150—153	..	4 18 0
65,780	,,	,,	6	Do. B	120—123	..	4 17 7
65,500	,,	June 30	4	Do. 4 p.c. Deb.	94—96	..	4 3 4
4,940,000	Stk.	May 12	9	Imperial Continental	182—184	+½	4 17 10
1,235,000	Stk.	Aug. 16	3½	Do. 3½ p.c. Deb. Red.	90—92	..	3 16 1
200,242	Stk.	Aug. 31	6	Lea Bridge Ord. 5 p.c.	118—120	..	5 0 0
561,000	Stk.	Aug. 16	10	Liverpool United A.	216—218	+1	4 11 9
718,100	,,	,,	7	Do. B.	163—165	..	4 4 10
306,083	,,	June 30	4	Do. Deb. Stk.	102—104	..	3 16 11
75,000	5	June 15	6	Malta & Mediterranean Met. of 5 p.c. Deb.	4⅞—5⅛	+⅛	5 17 1
560,000	100	Oct. 2	5		100—102	..	4 18 0
250,000	100	,,	4½	Melbourne 4½ p.c. Deb.	100—102	..	4 8 3
541,920	20	May 31	3½	Monte Video, Ltd.	12½—13	..	5 7 8
1,775,892	Stk.	July 28	4⅜	Newc'tle&G'tesh'd Con.	102—104	−½	4 4 2
529,705	Stk.	June 30	3½	Do. 3½ p.c. Deb.	87—89	..	3 18 8
55,940	10	Aug. 31	7/7/0	North Middlesex 7 p.c.	14½—15½	..	4 10 4
300,000	Stk.	Apl. 27	8	Oriental, Ltd.	138—140	..	5 14 4
60,000	5	Sept. 28	8	Ottoman, Ltd.	6½—7	..	5 14 4
31,800	53	Aug. 16	13	Portsea Island A	135—139	..	4 19 0
60,000	50	,,	13	Do. B	124—128	..	5 1 7
100,000	50	,,	12	Do. C	121—125	..	4 16 0
398,490	5	Oct. 12	8	Primitiva Ord.	7¼—7⅜*	..	5 6 8
796,980	5	June 30	5	Do. 5 p.c. Pref.	5⅛—5⅜	−1/16	4 13 0
488,900	100	June 1	4	Do. 4 p.c. Deb.	97—99	..	4 0 10
312,650	Stk.	June 30	4	River Plate 4 p.c. Deb.	95—97	..	4 2 6
250,000	5	Sept. 28	12	San Paulo, Ltd.	10½—11	..	5 9 1
115,000	10	,,	6	Do. 6 p.c. Pref.	11⅞—12¼	..	4 18 0
125,000	50	July 1	5	Do. 5 p.c. Deb.	50—51	..	4 18 0
135,000	Stk.	Aug. 31	10	Sheffield A	238—240	+1	4 3 4
209,984	,,	,,	10	Do. B	238—240	+1	4 3 4
523,500	,,	,,	10	Do. C	238—240	+3	4 3 4
90,000	10	Sept. 28	6	South African	8—9	..	6 13 4
6,429,895	Stk.	Aug. 16	5/9/4	South Met., 4 p.c. Ord.	116—118	..	4 12 8
1,895,445	,,	July 14	3	Do. 3 p.c. Deb.	79—81	..	3 14 1
209,820	Stk.	Aug. 16	8½	South Shields Con. Stk.	152—154	..	5 10 5
605,000	Stk.	,,	5⅝	S'th Suburb'n Ord. 5 p.c.	118—120	..	4 14 4
60,000	,,	,,	5	Do. 5 p.c. Pref.	115½—117½	..	4 5 1
117,058	,,	July 14	5	Do. 5 p.c. Deb. Stk.	121—123	..	4 1 4
502,310	Stk.	May 12	5	Southampton Ord.	108—110	..	4 10 11
120,000	Stk.	Aug. 16	7½	Tottenham A 5 p.c. and B 3½ p.c.	145—148	..	4 16 3
483,940	,,	,,	5⅝		115—117	..	4 16 1
149,470	,,	June 15	4	Edmonton 4 p.c. Deb.	96—98	..	4 1 8
182,380	10	June 15	8	Tuscan, Ltd.	8¾—9¼	..	8 13 0
149,900	10	July 1	5	Do. 5 p.c. Deb. Red.	96—98	..	5 2 0
236,476	Stk.	Aug. 16	5	Tynemouth, 5 p.c. max.	113—115	..	4 6 11
255,636	Stk.	Aug. 31	6⅞	Wands-worth B 3½ p.c. 3 p.c. Deb. Stk.	142—145	..	4 14 10
85,766	,,	June 30	3		71—73	..	4 2 2

Prices marked * are "Ex. div."

in progress between the Municipal Council of Johannesburg and Messrs. D. Stewart and Co. (1902), Limited, of Glasgow, and Mr. William Beardmore, shipbuilder and steel manufacturer, as guarantor, was advanced a step last Tuesday by the issue of the decision upon the merits of the question in dispute by Lord Ormidale, who heard evidence in the case at great length last July. Messrs. Stewart and Co. were contractors for the supply of gas-producing plant, gas-engines, and electrical plant, for tramway, electric lighting, and other purposes, in the city of Johannesburg. The Municipal Council said the plant supplied was not in accordance with the contract; but the defenders denied that there was any defect in the plant. The pursuers sued for repayment of £145,000, and for £200,000 as damages for breach of contract. The defender Beardmore was guarantor under the contract, and he was sued for the amount of his guarantee—£115,000. Lord Ormidale has given decree for £340,000, with expenses against the contracting firm, and has found the defender Beardmore liable in the amount of his guarantee, with right of relief against Messrs. Stewart. The decision proceeds mainly upon the ground that the defenders abandoned their contracts. [The case is noticed more fully in our "Legal Intelligence."]

CURRENT SALES OF GAS PRODUCTS.

[For Table of "Tar Products Prices," see p. 202.]

LIVERPOOL, *Oct.* 14.

Sulphate of Ammonia.

Throughout the week there has been a very firm tone in the market, and no difficulty has been experienced in realizing full prices for all parcels offered for sale, although no quotable advance has taken place. The purchasing has been largely for the covering of previous contracts for October delivery, but new business has also been in evidence. The nearest values at the close are still £14 2s. 6d. per ton f.o.b. Hull, £14 3s. 9d. per ton f.o.b. Liverpool, and £14 6s. 3d. per ton f.o.b. Leith. In the forward position, manufacturers have very strong views, and are now quoting £14 7s. 6d. to £14 10s. per ton f.o.b. at the best ports for October-March delivery, which fact has rather stood in the way of first-hand trading.

Nitrate of Soda.

The market has hardened during the past few days, and supplies on spot are firmly held for 10s. 1¼d. per cwt. for ordinary, and 10s. 4½d. for refined quality.

LONDON, *Oct.* 16.

Tar Products.

The markets for tar products continue very firm. Although there is not a large amount of new business doing in pitch, prices remain exceedingly strong. Benzols are very firm for near delivery; but there appears to be a little more stuff offering for forward. Creosote is extremely firm; and the demand is exceptional for both prompt and forward delivery. Crude carbolic remains in about the same position. Solvent naphtha shows signs of improvement. Heavy naphthas are very steady.

The average values during the week were: **Tar**, 21s. to 25s. *ex* works. **Pitch, London**, 40s. 6d. to 41s. 6d.; east coast, 40s. to 41s.; west coast, Manchester 39s. 6d. to 40s. 6d., Liverpool 40s. to 41s., Clyde 40s. to 41s. **Benzol, 90 per cent.**, naked, London, 9¼d. to 10d. f.o.b., North, 9¼d. to 9½d. f.o.b.; 50-90 per cent., naked, London, 8½d., North, 8d. to 8¼d. f.o.b. **Toluol**, naked, London, 8½d.; North, 7⅞d. to 8d. **Crude naphtha, in bulk**, London, 4¼d. to 4⅜d.; North, 3⅛d. to 3¾d. **Solvent naphtha**, naked, London, 9¼d. to 9½d. f.o.b.; North, 8d. to 8¼d. f.o.b. **Heavy naphtha**, naked, London, 10¼d. to 10½d. f.o.b.; North, 9d. to 10d. f.o.b. **Creosote, in bulk**, London, 2⅞d. to 2⅞d.; North, 2½d. to 2⅝d. **Heavy oils, in bulk**, 3d. to 3⅛d. **Carbolic acid, casks included, 60 per cent., west coast**, 2s. to 2s. 1d.; east coast, 2s. 1d. to 2s. 2d. **Naphthalene**, £4 10s. to £9; salts, 42s. 6d. to 45s., bags included. **Anthracene, "A" quality**, 1½d. to 1¾d. per unit, packages included and delivered.

Sulphate of Ammonia.

This market keeps steady, with a fair amount of inquiry. Actual Beckton is quoted £13 15s.; outside London makes, £13 10s.; Hull, £14 1s. 3d. to £14 2s. 6d.; Liverpool, £14 2s. 6d. to £14 5s.; Leith, £14 7s. 6d.; Middlesbrough, £14 1s. 3d. to £14 2s. 6d.

Ashbourne District Council and the Gas-Works.—At the meeting of the Ashbourne Urban District Council on Monday last week, the Clerk (Mr. R. Williams) announced that the Gas Company would receive not less than £35,000 if the Council adopted the ordinary procedure for acquiring the undertaking; and, in addition to this, there would be about £5000 costs. After some discussion, it was decided that the Clerk be instructed to write to the Solicitors of the Council, asking them to approach the Directors of the Company with the view of a settlement, and to ascertain the price at which the Company would be prepared to sell their undertaking to the Council by agreement.

Lighting Matters at Carnarvon.—The scheme for lighting part of Carnarvon by electricity has been discussed once more with negative result by the Town Council. It will be recalled that recently the Council, at a special meeting, approved of the principle of the scheme, with certain conditions as to cost; but subsequently, at an ordinary meeting, the validity of the decision was challenged. It was then determined to consider the matter at another special meeting—after the Mayor had ruled that the Council had committed themselves to the principle, and that nothing could be deferred except the consideration of details. When the Council met again last Tuesday, attempts were made to nullify this ruling; and finally a proposal to further defer consideration of the matter was carried by a majority of one.

RICHMOND'S NEW FIRE.

PERIOD SERIES.

THE FLAMBEAU.

The RICHMOND GAS STOVE & METER Co., Ltd.,

GASFIRE SPECIALISTS.

Offices & Showrooms: 132, QUEEN VICTORIA ST., E.C.

Offices & Works: ACADEMY STREET, WARRINGTON.

Inventors of the Interchangeable A.B.C. Series of Gasfires, Patent Combined Gas-Air Adjuster and Governor, Air Pad Fire-Brick, &c.

COAL TRADE REPORTS.

Northern Coal Trade.

There is a good general demand for coal. That for the Baltic, however, shows the fall which is usual at this season of the year; but the high rate of freights for the sea carriage is checking shipments in some degree. In steam coal, best Northumbrians are about 11s. 3d. per ton f.o.b., second-class steams are from 9s. 6d. to 10s., and steam smalls from 5s. to 6s. The output is heavy, and is well taken up under the circumstances. In the gas coal trade, there has been some check to the shipments to the Italian ports; but the home demand has grown, and seems likely to increase until after the turn of the year. Durham gas coals are 11s. per ton f.o.b. for best kinds; about 10s. for seconds; and "Wear specials" are up to 11s. 6d. There are inquiries for cargoes for Mediterranean ports; and these are influenced by the very high freights to the Italian ports under present conditions. Little gas coal has been sent to these ports of late; and there will probably be some heavy deliveries soon to be made, if a settlement of the difficulty as to freights could be gained. Gas coal seems to be booked-up far ahead. In coke, the general demand is good, and prices are firm. Gas coke is more plentiful, and may be quoted from 14s. to 14s. 3d. per ton f.o.b.

Scotch Coal Trade.

Trade is strong, with prices looking up. The situation is said to be due to a widespread fear on the part of the public of a strike among the miners, the likelihood of which occurring is not seriously entertained among coalowners. There is, therefore, an anticipation that present prices may not be maintained for long, and that reductions may be looked for, or that, at all events, there will be no further advances in price. The quotations are: Ell, 10s. to 11s. per ton f.o.b. Glasgow; splint, 11s. to 11s. 3d.; and steam, 9s. 9d. to 10s. The shipments for the week amounted to 352,113 tons—an increase on the previous week of 25,210 tons, and on the corresponding week of 13,362 tons. For the year to date, the total shipments have been 12,638,970 tons—an increase on the corresponding period of last year of approximately 167,700 tons.

Mr. Will Thorne, M.P., who is this year Chairman of the Parliamentary Committee of the Trades Union Congress, was invited, as the representative of the Gas Workers and General Labourers' Union, to become a member of the new Industrial Council, of which particulars are given elsewhere; he refused to serve. His reasons for declining were set out in a letter addressed to the President of the Board of Trade, in the course of which he expressed the opinion that the Council would weaken the power of organized labour; and he said he was not prepared to have that power curtailed in the slightest degree without entering an emphatic protest.

Gas Exhibition at Cardiff.

A comprehensive gas exhibition was opened in the Park Hall, Cardiff, yesterday, under the auspices of the Cardiff Gas Company. All the leading gas-stove and fittings manufacturers were represented; and there was on view an up-to-date selection of appliances for the use of gas. Bath geysers and hot-water circulators were shown in action; and the Voelker Lighting Corporation, Limited, manufactured incandescent mantles, using the machinery exhibited at the Festival of Empire at the Crystal Palace. Appliances for workshop and factory use were also on view. A series of high-class cookery lectures will be given twice daily by Miss Jennie Barker (Mrs. Norman D. Thomas) during the exhibition, which will remain open till the 28th inst. Cookery competitions have been arranged for school girls, and also a competition for school boys; and valuable prizes will be given to the successful competitors.

An Unsatisfactory French Municipal Gas Supply.

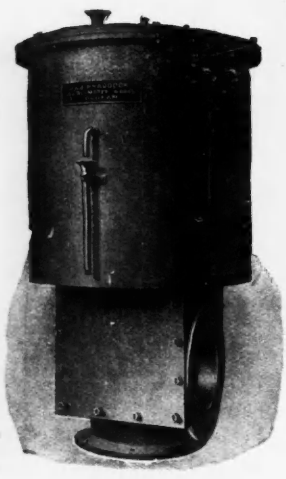
The ratepayers of Elbeuf, a town of 20,000 inhabitants, and the centre of a flourishing cloth industry in the Seine Inférieure, have been taught a sharp lesson with regard to the folly of municipalization, says the Paris Correspondent of the "Morning Post." The Town Council were persuaded by M. Mouchel, the Socialist Mayor and Deputy for the town, to manufacture and supply their own gas to the citizens. The experiment has proved disastrous. M. Mouchel recently admitted that the financial situation was as bad as it could be, and that a special rate would have to be imposed in order to make up the deficiency of £2400 on this year's working of the gas undertaking. He did not conceal the fact that the situation would be still worse next year, and that, in order to place the gas-works on a sound financial footing, it would be necessary to find a sum of £10,000. The report on the working of the new municipal service shows that the ratepayers have not even the satisfaction of being supplied with good gas. Never, it is said, was the town so badly lighted. In some quarters the lamps are lighted too late, and in others they are put out too late. The manager has been changed three times, the staff does not do its work conscientiously, a sum of £600 has been lost because the coal contracts were given out at the least favourable time of the year, and the result of all this mismanagement is that the price of gas will have to be raised. With praiseworthy frankness, the Mayor takes all the blame to himself. "Although I am a partisan of the *régime*," he says, "I shall perhaps see myself forced to abandon it." In any case, he declares that he considers his public career at an end.

The Strand Mantle and Machine Company, Limited, has been registered with a capital of £500, in £1 shares, to acquire any patents, licences, concessions, &c., connected with incandescent mantles or gas-burners, or machines for manufacturing them, and to adopt an agreement with Mr. J. I. Robin, who is the first Managing-Director.

BRADDOCK'S

RETORT-HOUSE

GOVERNORS.



No. 193.
Braddock's Enclosed Retort-House Governor, with Internal Float.

SECOND TO NONE.

For Efficiency and Reliability.

Many Repeat Orders have been received.

No. 244. Braddock's Enclosed Retort-House Governor, Beam Type.

J. & J. BRADDOCK (BRANCH OF METERS LIMITED), Globe Meter Works, OLDHAM,

Telegrams: "BRADDOCK, OLDHAM." National Telephone No. 815.

AND 45 & 47, WESTMINSTER BRIDGE ROAD, LONDON, S.E.

Telegrams: "METRIQUE, LONDON." Telephone No. 2412 HOP.

A Grateful Town Council.—At the last meeting of the Bideford Town Council, a letter was read from the Gas Company stating that, as the price of gas had been reduced, the charge to the Council for public lighting would be lowered for one-foot burners by 1s. 6d. and for two-feet burners by 3s. below the contract price for the ensuing year. Mr. W. Cock remarked that this was the second voluntary reduction made on the contract by the Company, who were dealing fairly with them. On his proposal, it was decided to send a letter of thanks to the Company.

Ebbw Vale Water Supply.—Last Wednesday, the new Carno water-works, Beaufort, were opened by Mr. Thomas Morgan, the Chairman of the Water Committee of the Ebbw Vale Urban District Council. The works, which are extensive, were commenced in the spring of 1905. The embankment is of a total height above the river bed of 98 feet. The gross capacity of the reservoir is 188 million gallons, and the net capacity available for purposes of supply is 182 million gallons. The five sand filter-beds will each pass about 200,000 gallons a day; and special arrangements are provided for the cleaning of the sand. After he had turned on the water, Mr. Morgan unveiled a tablet bearing the following inscription: "Ebbw Vale Urban District Council Carno Reservoir, opened by Mr. T. Morgan, Chairman of the Water-Works Committee, on Oct. 11, 1911. Geo. F. Deacon, LL.D., and Sir Alex. Binnie, Kt., Engineers; Thos. Hughes, Clerk; T. J. Thomas, Surveyor; H. L. Pearson, Resident Engineer." After the formal opening, the company were entertained by the Chairman of the Water Committee.

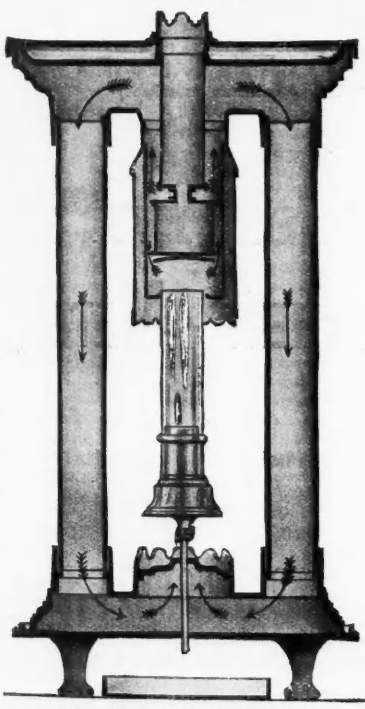
Charters Towers Gas and Light Company, Limited.—At the last general meeting of this Company, the Directors reported that the combined net revenue from the supply of gas and electricity for the six months ended the 30th of June was £1339, compared with £1335 for the eight months of gas and six months of electricity ended Dec. 31, 1910. The bank overdraft for the six months had been reduced by £930; but, in view of the fact that it still stood at £4044, the Directors were strongly of opinion that it would be the wiser course to refrain from paying any dividend for the time being, and they recommended that no distribution be made for the half year. In moving the adoption of the report, the Chairman (Mr. John Tilley) said he was pleased that the half-year's results had been so satisfactory, though he was personally sorry that the undoubtedly wise financial policy of endeavouring to clear off their overdraft quickly should preclude the payment of a dividend. He thought, however, the shareholders generally would endorse the recommendation of the Directors. It was only twelve months since the Company took over the Electric Supply Company's plant and business, to do which they had to contract an overdraft of £6500. Towards this they had at the time a fixed deposit of £1000, which on maturity went in reduction. The overdraft had been reduced; and there was a substantial amount due for gas and electricity, practically all of which could be regarded as good. The position, as a whole, was eminently satisfactory. The report was adopted.

Proposed Water-Works for Bocking.—A Local Government Board inquiry was held on Thursday relative to an application by the Braintree Rural District Council for sanction to borrow £7800 for works of water supply for the parish of Bocking. The Clerk (Mr. A. Hills) explained the scheme, which provides for about 8 miles of mains to serve the whole parish, the population of which is 3445, and the rateable value £10,423. A bore has already been made, and is yielding an ample supply of water. The Engineer (Mr. H. H. Sands) gave details of the proposals, and produced an analysis by Dr. Thresh, who stated that the water was of a high degree of purity and well suited for a public supply. One or two ratepayers opposed the application, on the ground that the time was inopportune to borrow the money, as negotiations to amalgamate Bocking and Braintree were going on, and any day a scheme might be laid before the two parishes.

Water Charges at Hyde.—The Hyde Town Council have adopted a new scale of water charges, recommended by the Water Committee, involving an increase to the consumers of about 25 per cent. The members of the Council who opposed the proposal argued that as the Hyde Corporation were simply acting as middlemen between the consumers and the Manchester Corporation, efforts should be made to induce Manchester to supply the Hyde consumers direct. Mr. Welch, the Chairman of the Committee, stated that the deficit on the Water Department last year was £866; for the current year it was estimated at £990; and for next year at £1340—practically a 3d. rate. The difference had to be made up either by the ratepayers or consumers; and the Committee contended that the latter ought to pay, especially as some houses in the borough were not supplied with town's water. The Committee's recommendation was carried by 13 votes to 7.

Progress of the Devonport Gas Undertaking.—Alderman Tozer, the Chairman of the Devonport Corporation Gas Committee, in a speech at a public meeting in the town last Thursday, referred to the progress of the gas undertaking. He said the Gas Committee had this year been able to reduce the price of gas from 2s. 6d. to 2s. 4d. per 1000 cubic feet—the first reduction, he believed, that had taken place for a quarter-of-a-century. Of 90 towns with a population of 50,000 and upwards, 50 had gas at a higher figure than Devonport. It was proposed in December, 1907, to increase the price from 2s. 6d. to 2s. 9d.; but a majority of the Council rejected the recommendation. The reason given for the suggested increase was the fluctuation in the price of coal; but whatever fluctuation took place to-day would not for some time make any difference in the charge for gas. The undertaking had been under the control of the Corporation for nine years. In the three years ending 1905, the average net profit was £1632; in the next three years, it was £1272; and in the last three, it had been £3125. They had also paid £69,150 off the capital; and they had a reserve fund of £9693, which was sufficient to meet any reasonable contingencies. It was the intention of the Committee to improve the lighting and heating power of the gas; and at the end of the year they hoped to lend all cookers free.

CLARK'S "SYPHON" STOVES.



Section A, showing Condensing Principle.

WORKING PRINCIPLE.

SECTION A.

This diagram shows the passage of the hot gases after leaving the burner. They first strike the central heating chamber directly over the chimney and pass over the shoulders down the tubes at the sides, where they condense into liquid and enter the tray provided for the purpose.

Analysis of Products:—

Sulphurous Acid, Sulphuric Acid, Carbonic Acid, Sulphur, Oxide of Iron, and Water.

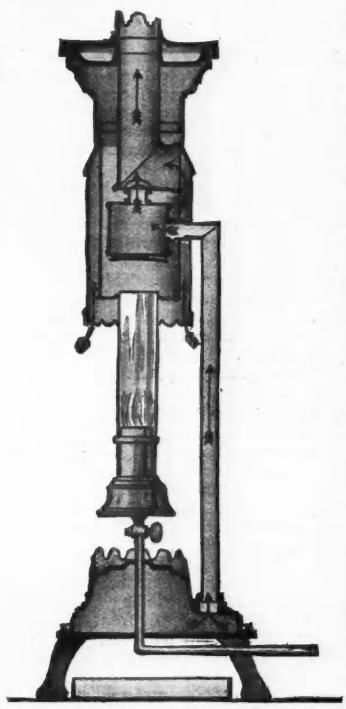
SECTION B

Explains the patented "SYPHON" principle; the arrows indicate the passage of hot air drawn from the lower portion of stove up to the central heating chamber, where it is mixed with air from the room and then finally passed out as pure heat.

The heat generated by the "SYPHON STOVE" is

ABSOLUTELY PURE

All products of combustion being rendered innocuous by automatic action within the Stove.



Section B, showing Patent "Syphon" Principle.

ADVERTISEMENT OF CLARK'S SYPHON STOVE CO., LTD., WARRINGTON, AND 132, QUEEN VICTORIA STREET, E.C.

Sale of Elland Gas Company's Stock.—A very successful sale of stock of the Elland-cum-Greetland Gas Company was recently conducted by Mr. Scarborough. He offered £140 of 4 per cent. consolidated preference stock, and it realized £102 10s. per £100; £80 of new ordinary stock (maximum dividend 5 per cent.) fetched £120 per £100; and £400 of converted ordinary stock (5 per cent., subject to the sliding-scale), £161 per £100. On the occasion of a previous sale, as high a figure as £152 per cent. was realized; and the figure at which the converted ordinary stock was placed at the recent sale constitutes a record, and is evidence of the confidence felt in the Company.

Merthyr Reservoir Scheme.—The Merthyr Borough Council have agreed to the recommendation of the Pontsticill Reservoir Committee to appoint Sir Alexander Binnie, Son, and Deacon, and Mr. T. F. Harvey, the present Borough Engineer, Joint Engineers for the scheme, upon the following terms: A commission at the rate of 5 per cent. on the total amount of the accepted tender to be paid. If such tender exceeds the sum of £350,000, no commission to be payable on the excess. A sum of £5000 to be paid when the contract is let, and the remainder in instalments as each certificate is granted. Assuming the works took eight years to construct from the time when instructions were given to prepare the plans, and that the total cost was £320,000, the total expense to the Corporation would be £17,200.

Southampton Water Supply.—At the meeting of the Southampton Town Council last Wednesday, a report by the Water Engineer (Mr. E. C. Rodda) on the position of the water supply of the borough, in which he suggested the provision of additional storage, was submitted by the Water Committee; and he is to report further on the subject. On the same occasion, the Parliamentary and Water (Joint) Committee reported having considered the resolution of the Water Committee as to increasing the present water supply, and also the resolution of the Council as to consulting experts in the matter. It was resolved that Mr. W. Whitaker, F.G.S., and another geologist be engaged to advise as to whether an additional supply of pure water can be obtained at Otterbourne or in its immediate vicinity. The report was adopted.

The Basis of Local Assessments.—At the meeting of the Association of Municipal Corporations which was opened at the Guildhall, London, last Saturday, the Lord Mayor of Bradford (Mr. Jacob Moser) moved a resolution expressing the view that the assessment of local rating should be altered, and that instead of such assessment being fixed on the value of hereditaments and premises, it should be fixed on incomes according to a sliding-scale of percentages. His suggestion was that for the purposes of local taxation "incomes" and not "rents" should be the basis for assessment. At present, he said, the burden fell largely on those least able to bear it, with the result that improvements of every kind were delayed or inadequately carried out. A resolution in favour of the appointment of a Committee of Investigation, with a view to urging the Government to take up the matter as one of practical politics, was brought forward, but was negatived.

Gas-Works Accident at Hull.—An inquest was held last Thursday on the body of John F. Collins, an erector, who met with fatal injuries while engaged at the East Hull Gas-Works. From the evidence of a bricklayer, it appeared that deceased was seen climbing up the framework of a recently erected hoist. He was heard to cry out; and it was noticed that his head was caught between the framework and the ascending lift. He could have used wooden ladders lashed to the framework, if he had wished. He could not have been at the place where the accident occurred had the wire-netting now on the framework been in place. The man who operated the lift said he looked round to see that all was clear; and, satisfied that such was the case, he set the machinery in motion. Shortly afterwards he heard a shout; and almost immediately he stopped the lift. A verdict of accidental death was returned by the Jury, which exonerated the driver of the lift from all blame.

Sale of Coke at Devonport.—Some discussion took place at the meeting of the Devonport Town Council on Thursday with reference to a recommendation of the Gas Committee that the sale of coke should be left in the hands of the Chairman and Engineer. Mr. W. J. Moon moved that the resolution be not confirmed, and expressed the opinion that the sale should be entrusted to the Works Sub-Committee. Other members supported this view. But Mr. Charlick explained that the Committee left the sale of coke with the Chairman and the Engineer in the hope of getting a better price; and this was what had happened. Alderman Tozer, the Chairman of the Gas Committee, explained that in the summer months there was a gradual increase in the stock of coke. Last year they offered from 500 to 1000 tons by tender, and obtained a very poor price. This year they thought it desirable to see if they could do better; and the matter was left with the Engineer and himself. The result had been that they disposed of just over 1000 tons at the average price of 13s. per ton, which was a great improvement on last year's figure. The price of coke in the yard was fixed at 15s. per ton. By a large majority, the Council approved the action of the Gas Committee.

Topsham Water Supply.—The question of the provision of an improved water supply for Topsham is under consideration. At a meeting of the Parish Council last Wednesday, a letter was read from the Rural District Council stating that terms had been obtained from both the Exeter Corporation and the Topsham Water Company, Limited. Mr. S. R. Lowcock, M.Inst.C.E., had been consulted, and on his report the Rural District Council favoured the purchase of the Water Company's undertaking, and the carrying out of works which he advised. Mr. Lowcock, in his report, stated that the scheme recommended by the District Council would cost £6026; and the annual working expenditure, including interest and repayment of capital, would be £627. The supply from Exeter would cost £3450; but the annual payment would be £965. If the Topsham works were purchased, the annual cost would be reduced at the end of thirty years to £265; while with regard to the Exeter scheme the Council would in that period be the owners only of the mains laid in the district. Several members of the Parish Council expressed opposition to the District Council's proposal; some being of opinion that no additional supply of water was needed. A resolution to this effect was passed; and it was also decided to ask the District Council to postpone consideration of the matter in order that the ratepayers might be consulted.

SAWER & PURVES

(With attachment detached.)

MAKERS OF THE

"POSITIVE"

PREPAYMENT METER.

Simple in Action.

Positive in Results.

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In his report for the past financial year on the working of the undertakings of the Pontypridd Urban District Council, Mr. L. R. Williams, the Accountant, says the revenue account of the Gas Department showed a gross profit of £6314; and after providing dividends on stocks and contributions to redemption funds, there was a profit of £647.

The Water and Gas Committee of the Hull Corporation have failed to arrive at a solution satisfactory to all concerned with reference to the use of water-meters. They have decided that for the future only manufacturers will be permitted to use meters; all other business people paying for their water supply in accordance with the rateable value of their premises.

A Local Government Board inquiry was recently held at Desborough before Dr. A. W. Brightmore, M.Inst.C.E., relative to an application from the Desborough Urban District Council for sanction to borrow £4430 for extending the water supply. Mr. F. T. Riley, J.P., the Chairman of the Council, having addressed the Inspector in support of the application, the inquiry closed without opposition.

We have received from the Carron Company a small supplementary pamphlet giving particulars, with illustrations, of their new "Abbey" series of gas-fires. There are eight designs, and, with their different sizes, they afford a selection of 21 varieties, which are supplied in many pleasing and artistic finishes, without any undue ornament. All parts of the new series are interchangeable; and the gas connection can be made on either the right or the left hand.

There was opened at the Royal Horticultural Hall, Westminster, last Friday, the third Model Engineer Exhibition, the organizers of which are Messrs. Percival Marshall and Co., Proprietors of the "Model Engineer." The exhibition will remain open until the 21st inst., and will doubtless appeal to a large number of people—demonstrating, as it does, the recent progress which has been made in model or small power engineering, both as a hobby and as a useful factor in technical education.

APPLICATIONS FOR LETTERS PATENT.

21,663.—Potter, W. G., "Gas-governors." Oct. 2.
21,665.—Farnham, R. V., "Gas-producers." Oct. 2.
21,721.—Simpson, S., "Coin-freed meters." Oct. 2.
21,777.—Carron, A., "Separating the oils from the pitch of tar." Oct. 3.
21,848.—Lunn, A. B., "Joints." Oct. 4.
21,896.—Compagnie pour la Fabrication des Compteurs et Materiel d'Usines à Gaz, "Motion transmitting devices." Oct. 4.
21,996.—Feld, W., "Production of sulphurous acid from sulphur." Oct. 5.
22,026.—Hart-Bayes, R. J., "Gas-generators." Oct. 6.
22,033.—Anderson, D., "Igniting gas-lamps." Oct. 6.
22,034.—Anderson, D., "Gas-lamp stoves." Oct. 6.
22,036.—Orr, F. J., "Generating and burning oil gas," Oct. 6.
22,042.—Hutchinson, J., "Testing tar." Oct. 6.
22,101.—Kent-Johnston, A. G., "Lighting and extinguishing gas-lamps." Oct. 7.
22,148.—Lauterbach, R., "Cock with counting or registering mechanism." Oct. 7.

WANTED, FOR SALE, CONTRACTS, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

Appointments Vacant.

Engineer and Gas Manager. Nottingham Corporation. Applications by Nov. 2.
General Manager (Gas Engineering Firm). No. 5458.
Assistant-Manager. Airdrie Gas-Works.
Carbonizing Foreman. No. 5459.
Draughtsman and Analyst. Huddersfield Gas Department. Applications by Oct. 28.
Draughtsman. West's Gas Improvement Company.
Resident Foreman. Beccles Gas Company.
Clerk (Inspector's Office). No. 5463.
Clerk (Shorthand, Typewriting, Book-keeping). Nuneaton Gas Company.
Plant and Machinery Repairer. Sevenoaks Water Company. Applications by Oct. 26.
Traveller or Representative. J., c/o Universal, 44, Gray's Inn Road, W.C.
Maintenance Inspector. Newton Abbot Gas Company. Applications by Oct. 26.

Appointments Wanted.

Chemical Plumber. No. 5450, c/o Mr. King, 11, Bolt Court, Fleet Street, E.C.
Chemist. No. 5464.

Agency Wanted. No. 5456.

Meeting.

Imperial Continental Gas Association. Cannon Street Hotel. Nov. 7. 2.30 o'clock.

Patent Licence, &c.

Acetylene Gas Generators. Haseltine, Lake, and Co., London.

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Cast Iron Borings. Box 96, c/o Taylor's Advertising Offices, Fleet Street, E.C.

Stocks and Shares.

Broadstairs Gas Company. By Auction. Nov. 7.
Pinner Gas Company. By Auction. Nov. 7.
South Essex Water Company. By Auction. Oct. 31.
West Kent Gas Company. By Auction. Oct. 31.
Woking District Gas Company. By Auction. Oct. 31. Two o'clock.

Wheel Metal.

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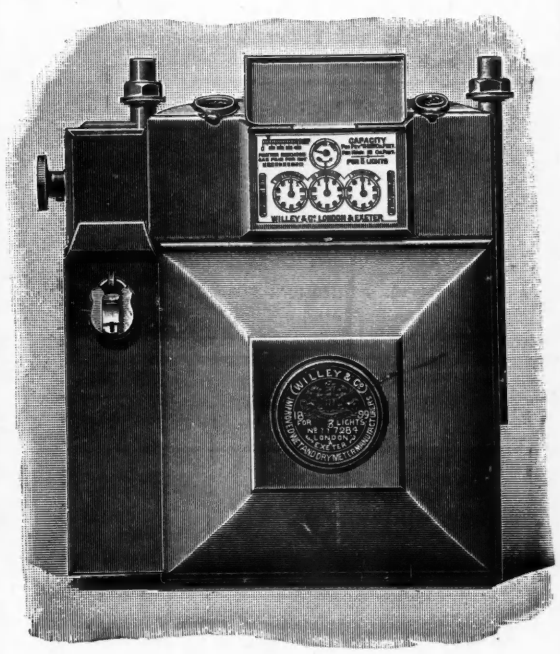

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TAR PRODUCTS PRICES.

Representative manufacturers give the following as fair current values for the week ending Oct. 14. Prices are net, and they include the usual packages and delivery f.o.b., f.a.s., or f.o.r., as customary.

Article.	Basis.	London.	North-East Coast.	East Coast, Yorks.	West Coast.		Glasgow.
					Liverpool.	Manchester.	
Tar, crude	per ton	—	20/- 25/-	21/- 25/-	—	21/- 25/-	—
Pitch	,,	42/6	39/6	40/-	40/-	39/6	40/-
Benzol, 90%	per gallon	1/1	-/10	-/10¾	-/9¼	-/9¾	-/10½
Benzol, 50-90%	,,	—	-/10	-/9	—	-/9¾	—
Toluol, 90%	,,	—	-/10¼	-/9	-/10	-/10 -/10¼	-/10
Crude naphtha, 30%	,,	—	-/4¼	-/4¼	-/3¾	-/3¾ -/4	—
Light oil, 50%	,,	—	-/3½	-/3¾	-/3½	-/3½ -/3¾	—
Solvent naphtha, 90-160	,,	—	-/10¼	-/10	-/10	-/10	-/11
Heavy naphtha, 90-190	,,	—	-/11	-/11	-/11¼	-/11½ -/11½	-/11
Creosote in bulk	,,	-/3	-/2¼	-/2⅝	—	-/2 5/16	-/2
Heavy oils	,,	—	-/2½ -/2⅝	-/2¼	-/2¾	-/2⅝	-/2¾
Carbolic acid, 60's	,,	2/4	2/2	2/2	—	2/1	2/2
Naphthalene, crude drained salts	per ton	—	43/9	42/6	47/6	47/6 50/-	—
,, pressed	,,	—	60/-	63/-	60/-	60/- 75/-	—
,, whizzed	,,	—	—	—	70/- 72/6	65/- 75/-	62/6
Anthracene	per unit	-/2	-/1½	-/1½	-/1¼	-/1¼	—

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No notice can be taken of anonymous communications. Whatever is intended for insertion in the "JOURNAL" must be authenticated by the name and address of the writer; not necessarily for publication, but as a proof of good faith.

COPY FOR ADVERTISEMENTS for the "JOURNAL" should be received at the Office NOT LATER than TWELVE O'CLOCK NOON ON MONDAY, to ensure insertion in the following day's issue.

Orders for Alterations in, or stoppages of, PERMANENT ADVERTISEMENTS should be received by the FIRST POST on SATURDAY.

Wanted, For Sale, and Tender Advertisements, Six Lines and under, 3s.; each additional Line, 6d.

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